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THE

KITCHEN GARDEN;

ITS ARRANGEMENT AND CULTIVATION.

BY

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PREFACE.

The object of the Author of the following pages was to present an accurate though condensed view of all the knowledge that previous writers upon the culture of culinary Plants, from the earliest times to the present, have recorded. By so doing, he hoped to collect, in a volume of moderate size and expense, information that is otherwise attainable only from works far too costly to be within the reach of a great majority of those of his countrymen, who, like himself, delight in the cultivation of their gardens. He has not been mistaken in thinking this could be effected, and he submits this volume to the public with the assurance that its accuracy may be relied upon, and the hope that it may be found to be a work that has been needed. His task has been

a humble one, for in this work he is almost exclusively "a retailer of other men's wares." He has only had to epitomise the statements contained in larger works, and aided by a small type, and avoiding repetitions, by arranging those plants together that required similar soil and treatment, he has succeeded in his primary objects.

Should the public approve of his production, he may at no distant period publish similar volumes upon the other departments of the garden. Any objections that might be raised to the alphabetical arrangement of the objects of cultivation, according to their botanical names, is removed by the Index at the end of the volume.

October, 1835.

KITCHEN GARDENING.

The Kitchen Garden is the most important object of the horticulturist's care, inasmuch as that its inhabitants, next to the products of agriculture, tend most to the support of mankind.

It often affords the chief support of the cottager, and ought to be the constant attendant of his dwelling. Of more exalted mansions it is always an accompaniment, but it is much to be regretted that a more plentiful use of its products is not adopted in preference to grosser aliment.

The kitchen garden also has for its inmates many plants chiefly valuable as rendering other kinds of food more palatable, or as possessing sanative qualities. These last formerly far exceeded in number all the plants of the Materia Alimentaria. The subsequent more general employment of mineral medicines has reversed this state of our kitchen garden. The culture of aromatic herbs is also much less attended to since the introduction of spices.

SITUATION OF THE KITCHEN GARDEN.

In selecting the site, and in erecting the inclosures, as well as in the after preparation of the soil, the ingenuity and science of the horticulturist are

essentially requisite. He will be called upon to rectify the defects and to improve the advantages which nature affords; for it is very seldom that the natural situation of a mansion, or the plan of its grounds, allows him to construct it in the most appropriate spot.

A gentle declination towards the S., with a point to the E., is the most favourable aspect; to the N. E. the least so: in short, any point to the south is to be preferred to one verging towards the N. A high wall should inclose it to the N. and E., gradually lowering to the S. and W. If, however, a plantation or buildings, on the east side, at some distance, shelter it from the piercing winds which blow from that quarter, and yet are at such a distance as not to intercept the rays of the rising sun, it is much to be preferred to heightening the wall. It is a still greater desideratum to have a similar shelter, or that of a hill on the S.W. and N.W. points.

The garden is best situated at a moderate elevation; the summit of a hill, or the bottom of a valley, is equally to be avoided. It is a fact, not very difficult of explanation, that low lying ones are the most liable to suffer from blights and severe frosts; those much above the level of the sea are obviously most exposed to inclement winds.

SIZE OF THE KITCHEN GARDEN.

To determine the appropriate size of a kitchen garden is impossible. It ought to be proportionate to the size of the family, their partiality for vegetables, and the fertility of the soil.

It may serve as some criterion to state that the management of a kitchen garden occupying the space of an acre, affords ample employment for a gardener, who will also require an assistant at the busiest periods

of the year. In general, a family of four persons, exclusive of servants, requires a full rood of open kitchen garden.

THE WALLS

Are usually built in pannels from fifteen to thirty feet in length, one brick thick, with pillars, for the sake of adding to their strength, at these specified distances; the foundation a brick and a half thick. The plan of Mr. Silverlock, of Chichester, is worthy of adoption, since, if well constructed, it is equally durable, and saves one third of the expense. Walls so constructed are stated to become dry after rain much more rapidly than a solid wall of the same or any other thickness; and there appears not a shadow of a reason why it should not ripen fruit equally well. He forms the wall hollow, nine inches in breadth, by placing the bricks edgeways, so as to form two facings; they are laid in good mortar, and the joints carefully finished. They are placed alternately with their faces and ends to the outsides, so that every second brick is a tie, and in each succeeding course a brick with its end outwards is placed on the centre of one laid lengthways on either side. The top of the wall must be covered with a coping of stone or bricks, projecting two inches. It is strengthened at every twenty feet by piers of fourteen inch work, built in the same manner, with bricks laid on edge*. The mode of constructing the piers, obviating the disadvantages arising from training branches round their sharp angles, which often causes them to gum, recommended by the Rev. T. Cullum, of Bury St. Edmonds, is to have their corners bevilled. He also

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* Trans. Hort. Soc. Lond. iv. p. 244.

advises the copings to project much further than they are usually made to do, even as much as twelve inches, but his reasoning refers more immediately to the management of wall-fruit*.

It is a practice, sanctioned by economy, to build the wall half brick thick, on a nine inch foundation, and to compensate for its want of strength a waved form is given. Both the smallness of its substance, and its form, are found, however, to be inimical to the ripening of fruit. In every instance a wall should never be lower than eight feet.

PALING AND HEDGES.

Next to a wall, a close stout paling of the above height is to be preferred. A hedge is not only an imperfect screen, but in other respects is worse than useless, since nothing can be trained to it, and its roots exhaust the soil in their neighbourhood very considerably; as the south fence of a garden it may be employed without such numerous disadvantages. For its formation quick or hawthorn is in general employed, and is, perhaps, the worst shrub that could be made use of. A hawthorn hedge, says Mr. Williams, of Pitmanston-house, near Worcester, is the nursery of the same aphides, beetles, and caterpillars, that feed upon the foliage of the apple and pear, from hence they spread to the trees nearest the hedge, and finally overrun the whole garden. Having thus deprecated the use of the hawthorn, he proceeds to demonstrate the superiority of evergreen over deciduous hedges; and more especially recommends the holly, which he states to be nothing near so slow a

* Trans. Hort. Soc. Lond. iv. pp. 269—71.

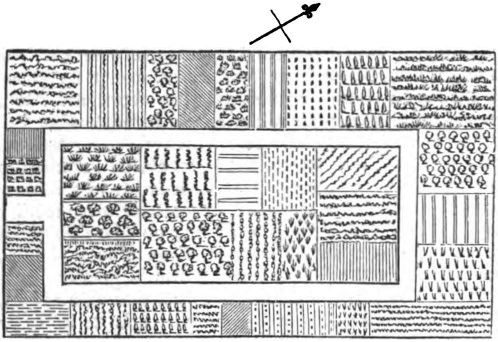
grower as is generally imagined. In a cloudy day in April or May, the wind seems to be actually refrigerated in passing through a thick hawthorn hedge, and this may be accounted for on the same principle that cool air is obtained in the houses of India, by sprinkling branches of trees with water in their verandas. Holly, laurel, and most evergreens exhale but litt'e moisture from their leaves, except for about a month in June; consequently in April and May, when we most require warmth, and in September and October, the leaves of these, when fully exposed to the sun, become heated to the touch, he surmises to 85° or 90° *. Added to this, hoar frost, or a deposition of moisture of any kind, never attaches so readily or remains for so long a time upon the foliage of evergreens as upon the sprays of deciduous shrubs, consequently the refrigeratory power is greatly diminished. When the garden is of considerable extent, three or four acres and upwards, it admits of cross walls or fences for an increase of training surface and additional shelter.

PLAN OF THE KITCHEN GARDEN.

In forming the ground plan of a kitchen garden, utility is the main object. The form and aspect represented in the accompanying sketch, are, perhaps, as unobjectionable as any, since none of the walls face due north, and consequently the most advantage possible is obtained for the trees as respects their exposure. A border should extend round under the wall of about ten feet breadth, the widest on those sides that face the south, which not only is beneficial

* Trans. Hort. Soc. Lond. ii. p. 354.

to the trees, but convenient for raising early crops, &c. Next to this should be a walk five feet in width, likewise extending round the area.



WALKS.

Clayey gravel is best employed for the walks, though they are often formed of road-drift, sand, or cinders; grass is inconvenient, not only from its wetness, but from the injury it sustains from the wheelbarrow, &c. Each walk should be laid five inches thick of the material employed, being founded upon stones, brickbats, clinkers, &c., which serving as an underdrain, keep it dry in the wettest weather. It should be gently arched, as this form tends also to keep it in a dry state, and to prevent it sinking into holes. Beneath the walks the mould ought to be good, as the roots of the trees extend in general beneath them.

EDGINGS.

Box and other live edgings being a harbour for snails, slugs, and other vermin, are best excluded; and the limits of the beds and walks marked by a single course of bricks, as these are not only durable, but save much labour in keeping them up. On the edges of the cross-paths parsley, thyme, or other pot-herbs may be employed for this purpose.

PLANTING FRUIT TREES.

The insertion of the fruit trees is the first thing to be attended to, at the proper season, after the formation of the garden, both against the walls and on the borders; on the main compartments no fruit tree of a size larger than the gooseberry shrub should on any account be admitted, for not only are the culinary tribes injured by their presence, but the roots of the trees must either be materially injured, or, what is as objectionable, the beds cannot be submitted to the spade; even the gooseberries, raspberries, &c., should be planted in compartments by themselves, they then can have any requisite cultivation performed more easily, and are prevented injuring other crops.

Espaliers ought not to be nearer to each other than fifteen or twenty feet. Dwarf standards, if admitted, at least the same. If these or full standards are necessarily admitted on the main quarters, they ought to be set at least fifty feet apart, and towards the angles of the divisions.

FORCING.

Thus much can be done in taking advantage of all natural circumstances that contribute to the welfare of plants, and to obviate as much as possible

their defects, without having recourse to any artificial heat, &c. But the temperature of our climate, even with the most just management, can never be raised sufficiently high, by any practical means of accumulation, for the growth of the plants of warmer countries; nor in winter, to grow certain vegetables, which are then in request, that will flourish at other seasons in our unsheltered beds. To overcome this barrier of nature, an artificial temperature is obtained, and the severity of the natural atmosphere excluded by means of glass. This constitutes the Hot House and Forcing department; but, as far as it is connected with the inhabitants of the kitchen garden, it is here treated of, as preventing, in a great measure, the necessity of ulterior reference, which cannot, without endless repetitions, but confuse and disturb every advantage that is obtained by a systematic arrangement. In pursuance of this opinion, directions for the construction of hotbeds, sizes of frames, &c., are given here, since for all crops that require artificial heat, the construction of a hotbed is the same, consequently the following will serve as a general guide.

HOTBEDS.

A hotbed is in general constructed of stable dung, of which that made by the best fed horses is to be preferred. It should be about ten days from the stalls, and without too large a proportion of litter. After being thrown into a heap of conic form for five or six days, it must be so turned over that the inner parts are brought to the outside, the clots well separated with the fork, the heap being re-formed conical as before, and left for an equal number of days. By this time and treatment the dung in general acquires a sufficient and steady heat; if, however, it is very dry and fresh, it must be moderately moistened and left for five or six days more. At the time of

forming the heap, as well as at every turning, water should be applied, if its substance appears at all dry, as a regular state of moisture is of first importance to the obtaining a favourable fermentation. There is a considerable difference of opinion with respect to the length of time that dung should continue thus in the heap, some gardeners protracting it even to four weeks; a more decisive rule appears to be, that it should remain until the straw in general assumes a dark brown colour, when it should be immediately formed into the bed. If, of necessity, dung is used that is neither fresh nor strong, a portion of coal ashes, or a larger one of leaves or tan, may be mixed with advantage. If it is fresh, the addition of these is apt to make the fermentation violent and transitory. Dr. Hunter, however, recommends leaves to be mixed at all times, as heat is thereby generated during a greater length of time*. In cold, wet, or boisterous weather the heaps should be covered to a moderate depth with litter.

In making the beds, they must be so situated as to be entirely free from the overshadowing of trees, buildings, &c., and having an aspect rather a point eastward of the S. A reed fence surrounding them on all sides is a shelter that prevents any reverberation of the wind, an evil which is caused by paling or other solid inclosure. This must be ten feet high to the northward, or back part; of a similar height at the sides, but in front only six. The wicket or gate must be of sufficient width to admit a loaded wheelbarrow. An inclosure of this description, 100 feet in length and sixty broad, will be of a size sufficiently large for the pursuit of every description of hotbed forcing. But for cucumbers, melons, and a few inferior articles, a space for six or eight lights is sufficient. Fruit may be forced slightly by being

* Georg. Essays, ii. p. 63.

trained within it on the southern aspect; the fence on that side, in that case, must be of brick or wood, and, to assist in increasing the temperature, painted black. To prevent unnecessary labour, this inclosure should be formed as near to the stable as possible.

For the reception of the bed, a trench is often recommended to be dug, of its determined length and breadth, and six inches deep, if the soil is wet, or eighteen or more if it is dry. In a dry soil and climate this cannot be productive of much injury, but, otherwise, it almost always chills the bed; at the same time, it is to be observed, that it is never productive of benefit, further than not being so high it is easier of access, but gives much additional trouble both at the time of founding, and afterwards when linings are to be applied. From these and other considerations, which may be discerned as the future operations are traced, it appears that a hot-bed is best founded on the surface to which a gentle inclination from the N. towards the S. should be given.

The site of the bed being determined, a stake should be driven perpendicularly at the four corners, as a guide for its rectangular construction. The dung must be thoroughly mixed just before it is used, and as carefully separated and spread regularly with the fork as the bed is formed with it. It is beneficially settled down in every part alike by beating with the fork, as the work proceeds, rather than by treading, for if too much compressed a high degree of heat is generated, but is soon spent; a contrary phenomenon is often caused if trod to a still greater excess, viz., that no heat at all is engendered.

The longest, or littery, part of the dung should be laid at the bottom of the bed, and the finer fragments of the dung upon the top. If it is not regularly and moderately moist throughout, it should be sprinkled

over with water. As the surface on which the bed is founded is usually horizontal, so is the dung laid perfectly parallel with it. Mr. Knight recommends it, on the contrary, to be equally inclined with its foundation, that it may associate well with the new form which he recommends for frames.

The breadth of a bed must always be from four to five feet — in the depth of winter four and a half feet high when firmly settled;—to form it of this size, about twelve barrow-loads are required to a light. In early spring a height of three and a half feet is sufficient, and as the season advances it may decline to three or two and a half feet. In May, or early summer, when the only object is to hasten the germination of seeds, two feet, or eighteen inches, is not less than the necessary height. The length of the bed in all cases must be guided by the size of the frame.

To prevent the sudden changes of temperature in the external air affecting the heat of the bed, a practice of Mr. Fowler, who was the first person that ever produced cucumbers about Christmas, is much to be commended: he was accustomed to coat the sides of the bed with sand (coal ashes or earth might be substituted) to a thickness of two feet. "This," observes Bradley, "not only prevents a fluctuation in the heat, but maintains the bed in a regular one much longer."

As the heat declines, *linings*, or, as they might be more properly called, *coatings*, are made use of; which consist of hot fermenting dung, laid from eighteen to twenty-four inches, in proportion to the coldness of the season, &c., all round the bed, to the whole of its height, and if founded in a trench, one equally deep must be dug for the coating, it being of importance to renew the heat as much as possible

* Gen. Treat. on Husb. and Gard. ii. p. 63.

throughout its whole mass: if after a while the temperature again declines, the old coating must be taken away, and a similar one of hot dung applied in its place. As the spring advances, the warmth of the sun will compensate for the decline of that of the bed; but as the nights are generally yet cold, either a moderate coating, about nine or ten inches thick, is required; or the mowings of grass, or even litter, may be laid round the sides with advantage.

The depth of earth, as well as the time and manner of applying, vary considerably; it should never be put on until four or five days after the bed is formed:—before it is applied the edges of the bed should be raised full eight inches higher than the middle, as from the additional weight of the frame they are sure to sink more, and quicker; thereby often causing the earth to crack and injure the roots of the plants*.

The roots of plants being liable to injury from an excessive heat in the bed, several plans have been devised to prevent this effect. If the plants are in pots plunged in the earth of the bed, they may be raised an inch or two from the bottom of the holes they are inserted in, by means of a stone. But a still more effectual mode is to place them within other pots, rather larger than themselves: a space filled with air being thus interposed between the roots and the source of heat, an effectual security is obtained. To prevent the same injury occurring when the plants are in the earth of the bed, a moderate layer of neat's dung, laid between the earth and the fermenting mass, is an efficient precaution, and is much preferable to a similarly placed layer of turf, which interrupts too much the full benefit of the heat. A plan recommended by Bradley is well worthy of notice. A woven hurdle, somewhat larger than the frame, being placed upon the dung, on this its woodwork can rest,

* Trans. Hort. Soc. Lond., iii. p. 147.

and the earth is laid within it: thus the whole can be moved together without disturbance *. This would especially be of advantage when bark is employed, which requires occasional stirring to renew its heat, in case of emergency, when time cannot be allowed for the bed becoming regular in its heat before the plants are inserted. Besides these precautions, vacancies should be left in the mould, and holes bored with a thick pole into the bed, which must be filled up with hay or dung when the danger is passed.

For ascertaining the internal temperature of the bed, the thermometer is the only certain guide; as it also is for judging of the temperature of the air within the frame: the ingenious mode of introducing it into the body of the bed recommended by M. Regnier of Paris, is to have the thermometer inclosed in a wooden case of the size and form of an ordinary dibble, which is to be lined with baize, and fitted with a cap of tinned iron to exclude the exterior temperature. The end which enters the earth is shod with perforated copper†. In conjunction with the thermometer, *trying sticks* may be employed for occasional observation: these are smooth laths of wood, about two feet in length, thrust into different parts of the bed, which, being drawn out and grasped quickly, afford a rough estimate of the heat of the bed.

The small content of the frame, and the rapid deterioration of the air within it by the plants, render its frequent renewal necessary. To effect this, the common practice is to raise the glasses in proportionate heights according to the state of the air, and to prevent any injury arising, when necessarily admitted during inclement weather, mats are hung over the opening; but notwithstanding these precautions, the supply of

* Gen. Treat. on Husb. and Gard., i. p. 47.
† Mem. Caled. Hort. Soc., iii. p. 180.

air can seldom be regular; hence, and from sudden chills, the plants are often checked, sometimes essentially injured. It may be remarked here, that raw, foggy days, if anything, are more unfavourable than those that are frosty for the admission of air.—A complete remedy for all these difficulties is afforded by a plan suggested by Dr. Hales, the celebrated vegetable physiologist, since by it a regular supply of warm air is kept up, and renders it unnecessary to raise the lights, except in the most favourable times. His mode succeeds on the principle that warm air ascends, and simply consists of a pipe passed through the body of the bed, one end communicating with the exterior air, the other opening into the frame, at one of the top corners of which an aperture must be made; the heated air of the frame will constantly be issuing from this aperture, and its place supplied by that which rises through the pipe*. This suggestion is more practically illustrated by Mr. Keith of Ravelstone, who states that he employs a pipe of lead about two or three inches in diameter, bent nearly at a right angle, and each limb being three feet long; one of these to be placed horizontally as the bed is forming, with its mouth extending into the open air; that of the other opening into the frames; a cap should be fitted to the first, and by a slit on its under side the quantity of air admitted can be regulated†.

Although stable manure, from its abundance, is generally employed for the constructing of hot beds, yet there are several other vegetable matters that are also in use for the same purpose. Tanners' bark, from its long continuance and regularity of heat, is much to be preferred, especially for very tender exotics. In many situations it can be obtained at a cheaper rate than stable dung: it should be employed when

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* Lewis' Chem., 2nd ed. i. p. 411.

† Mem. Caled. Hort. Soc., iii. p. 185.

fresh drawn from the vats, or at most when a fortnight or three weeks old; it must lay in a heap for six or eight days, to allow the escape of the superfluous moisture; in summer this is not of such material consequence, as an excess of wet is at that season not so liable to prevent fermentation. If the ground is dry, a pit three feet deep may be dug, and is better if lined with boards or brickwork; but whatever may be the nature of the soil, it is best to form this case or bin of a similar height upon the surface. Without some support the tan will not form a solid bed, and if mould becomes mixed with it, the fermentation is retarded, or entirely prevented. The breadth must not be less than five or six feet, or of a length shorter than ten or twelve, otherwise the heat will not be lasting. When the bark is laid, it must be gently settled with the fork, but never trodden upon; for if violently compressed it loses the power of fermenting: if the bark is fresh, and not ground very small, it attains a sufficient warmth in a fortnight for the insertion of the plants, and will continue in heat for two or three months; the larger the fragments of the bark are, the longer time it requires to ferment, but in an equal proportion it attains a higher temperature and preserves it much longer; middle-sized bark is therefore in general to be preferred; and, added to the above considerations, it is to be remarked that when made of large fragments violent and sudden excesses often arise, even after the bed has been constructed two or three months; on the contrary, if very small, the fermentation soon passes off.

When the crops are removed and the heat declines, if well stirred, and a load or two of fresh bark mixed with it, the bed will acquire and continue in heat for an equal further lapse of time: this may be repeated throughout the year as often as the heat is found to decline. But it is necessary every autumn entirely, or nearly so, to reconstruct the bed with fresh bark;

for when the old is far advanced towards putrefaction, it will no longer generate heat. If the bed is required in a shorter time than it would of itself acquire a sufficient temperature, a small quantity of fresh fermenting dung may be placed at the bottom of the bed; otherwise this is a detrimental practice, occasioning often a violent, and always a transient fermentation.

The leaves of the oak and sweet chestnut, and doubtless of many other trees, answer for hotbeds as well or even better than tanners' bark, since they will continue to afford a moderate heat for nearly twelve months, without any addition or stirring. They are to be collected as they fall in autumn, and carried to some situation, or be so hurdled in, that they may be preserved from scattering by the winds; the heap should be six or seven feet thick, trod firmly down, and moderately watered if dry. In a few days a very powerful heat is produced, and in five or six weeks will have become so regular, that it may be broken up, and the beds constructed with its materials, water being again employed if dryness appears, and they must be well trod down as before. There are many other substances that generate heat during fermentation; there is perhaps no vegetable substance that does not. Even a heap of dry sticks acquires a strong accession of temperature if moistened. Mr. Burnet of Kennet, N. B., recommends the trial of the refuse matter thrown off in dressing flax, for constructing hotbeds: "this refuse," he says "he has observed, when left undisturbed, continue at a temperature of 64° for many months;" he seems to intimate as long as fourteen*. This material is, however, to be had in very few districts. Grass, and other green herbage, and even wetted straw mixed with coal-ashes, have been used on an emergency with success.

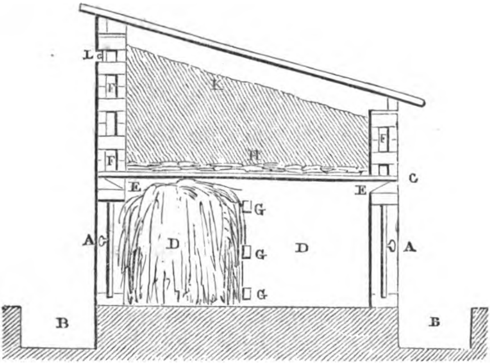
* Mem. Caled. Hort. Soc., ii. p. 219.

Instead of forming hotbeds with open sides, as has been hitherto described, pits of brick-work and other materials are very generally constructed for containing the fermenting mass.

Mr. Flanagan, gardener to Sir T. Hare, of Stow Hall, Norfolk, and Mr. West, who holds the same situation under the Marquis of Northampton, at Castle Ashby, have each proposed plans of pits, of which that of the first horticulturist is the least expensive; that of the latter more economical in other respects, not only as preventing the waste of heat, but in the best mode of applying it. The plan of Mr. Smith, given under the head Melon, appears to be superior to either. It may be laid down as a fundamental principle, that, in applying heat, it should always be brought to the bottom of the body to be heated.

Mr. Flanagan only allows the *heat* of fermenting dung to be employed, the steam being prevented entering the frame. One advantage arising from this he states to be, that fresh-made dung may be employed, and, consequently, the loss sustained by any preparation is prevented. If, however, it be a fact that the steam of dung is rather beneficial than otherwise, fresh fermenting dung can be used, without any detriment that I am aware of, in other pits of which we have plans. Mr. F. describes his pit as follows:—It is four feet deep within; the lowest ten inches of solid brick-work sunk in the earth; the remainder is a flue, three inches wide in the clear, carried entirely round the pit; the inner wall of which, forming the sides of the pit, is four-inch work, well bedded in mortar, and pointed, to prevent the steam penetrating; the outer wall of the flue is also four-inch but open work, to admit the steam and that of dung-coatings into the flue, the top of which is rendered tight by a covering of

tiles, &c. The frame rests on the external wall of th flue. The cavity of the pit, which is kept dry b means of drains, is nine feet two inches long, two feet eight inches wide, and four feet deep. It is filled with broken bricks, to within eighteen inches of the top; then a foot of short cold dung, six inches of very rotten dung, trod down so as to admit half an inch depth of coal-ashes, for preventing the intrusion of any worms that may be in the dung, complete the structure*.



The accompanying sketch and references will fully explain the plan of Mr. West. D D, chamber in which the dung is placed, three and a half feet deep, surrounded by nine-inch brick-work. One half of this is filled longitudinally with dung at the commencement, which, if kept close shut up, will last

* Trans. Hort. Soc. Lond., vol. iv. p. 188.

twelve or eighteen days, according to the quality of the dung. As the heat declines, the other side is filled, and the temperature is further sustained by additions to the top of both, as the mass settles. When this united heat becomes insufficient, the side first filled being cleared, the old manure must be mixed with some fresh, and replaced; this being repeated alternately to either heap as often as necessary. A A, are the doors, two of which are on each side, for the admission of the dung. They are two and a half feet square, fitted into grooves at the bottom, and fastened by means of a pin and staple at the top. B B, are small areas sunk in front, surrounded by a curb of wood. G G G, are bars passing longitudinally, as a guide and support in packing the dung. C, represents a bar of cast-iron, two inches wide and three-quarters of an inch thick, placed on edge, of which there are a row a foot asunder across the chamber, to support a layer of small wood, branches, and leaves, H, for the purpose of sustaining the soil, K, in the upper chamber; E E, represents the orifices, of which there are a series all round the pit, communicating with the flue F F F, which surrounds the bed; the exterior wall of this flue is built with bricks laid flat, the inner one of bricks set on edge. The flue is two inches wide, and, for the sake of strength, bricks are passed occasionally from side to side as ties. The top of the flue, and the internal part of the wall, which rise, at the back and front, to the level the earth is meant to stand, are covered with tiles, over the joints of which slips of slate, bedded in mortar, are laid, to prevent the escape of the steam of the dung. L represents one of two plugs, which stop holes, left to regulate the heat and steam as may be necessary. The outer wall supports the lights. For the convenience of fixing the dung, it is best to fill the half of the

chamber at the commencement, before the branches, mould, &c., are put on*.

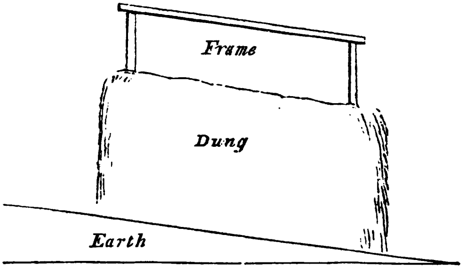
The gardener of R. Vachell, Esq., of Coptford Hall, Essex, on a somewhat similar principle as the above, adopts a plan remarkable for its simplicity. A bed of faggots, four feet high, being laid as even as possible, and sustained in their places by means of stakes, are covered with long litter and tan to prevent the steam rising into the frame, which, together with the mould, are placed as usual. The heat is afforded from coatings of hot dung, renewed as often as required †.

FRAMES.

Frames vary in their proportions. When made in the usual form, the back of the frame for pine-apples should be at least three feet and a half high, the front fifteen inches, but greater heights are allowed when this shelter is employed for plants of taller growth. Those employed for melons and common purposes, are not more than fifteen inches high behind, sloping to seven in front. The breadth in every instance about five feet; the length according to the number of lights, each of which is usually forty inches wide. They ought not to be constructed for more than three lights, for, beyond that size, they become unwieldy. If, however, they are constructed of a larger size, as likewise those of an extraordinary height, they should be constructed with moveable joints, so as to take to pieces for the convenience of removal. Mr. Knight has suggested an important improvement in the form of frames, which, from its obvious rationality, must strike conviction to

* Trans. Hort. Soc. Lond., vol. iv. p. 220.
† Trans. Hort. Soc. Lond., vol. iv. p. 455.

every reader. He observes that the general practice is to make the surface of the bed perfectly horizontal, and, to give an inclination to the glass, that side of the frame which is to stand towards the north is made nearly as deep again as its opposite, so that if the mould is placed of an equal depth (as it ought to be) over the whole bed, the plants are too far from the glass at one end of the frame, and too near at the other. To remove this inconvenience, he points out the mode of forming the bed on an inclined plane, and the frame formed with sides of equal depth, and so put together as to continue perpendicular when on the bed, as represented in the accompanying sketch*.

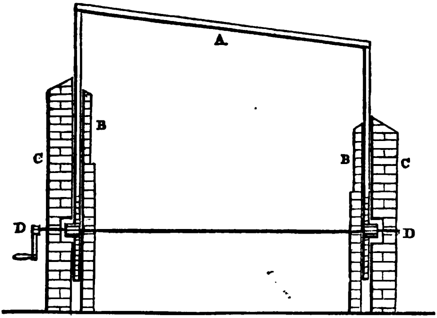


There are several minor points in the construction of frames that deserve attention. The strips of lead or wood that sustain the panes of glass should run across the frame and not lengthways; they then neither obstruct so much the entrance of light, nor the passing off of rain. The inside of the frame should be painted white, since plants generally suffer in them for want of light; if the accumulation of heat was required the colour should be black.

* Trans. Hort. Soc. Lond., vol. i. p. 142.

RAISING THE FRAMES.

It is a well-known difficulty that the gardener has in raising the frames, so as to keep the foliage of the plants within them at a determined and constant distance from the glass; to remedy this, Mr. Nairn, gardener to J. Creswell, Esq., of Battersea Priory, has introduced the ingenious contrivance represented in the accompanying sketch and references—A, a moveable frame—BB, inside lining of the pit—CC, outer wall. Between these the sides of the frame pass, and are lowered or elevated by racks and spindles, D D *.



A more simple plan might perhaps be adopted, by having frames of the same length and breadth as the original, but only from an inch to three inches or upwards deep: these, as necessary, might be put on the top, and would be kept close by the pressure of the lights; bolts and nuts might also be easily applied, and the insterstices rendered still more impervious to air by being faced with list.

* Trans. Hort. Soc. Lond., vol. iii. p. 130.

There are one and two light frames, which are chiefly employed in raising seedlings, &c. Akin to these are hand-glasses, quadrangular and bell-shaped; those with cast-iron frames are beyond comparison more durable than those of any other material. Paper frames are often employed in the place of matting, for shading and sheltering hand-glass crops, with great advantage. If employed alone throughout the growth of any forced crop, unremitted attention is necessary, and is seldom requited with good success. The best form is that of the pitched roof of a house. The wood-work should be firm and strong, but as light as possible; of varied size, but generally about ten feet long, four feet wide at the bottom, and about thirty inches high to the pitch. On each side two pannels should open on hinges, within two feet of each end, each pannel eighteen inches wide, for the convenience of admitting air, &c. A lattice-kind of work, with wide intervals of packthread, should be made over the frame, and fastened firmly to its wood-work, for the support of the paper during violent winds. The best sort of paper is a moderate kind of white printers' paper. Whited-brown paper is however generally employed; but whichever is used, it should be as stout as possible. This being pasted smoothly over the frame and perfectly dry, must be treated lightly with linseed oil that has been boiled. These frames should be prepared a considerable time before wanted, that they may be completely dry, and free from the oily odour, which is very obnoxious to plants.

SHELTER FOR THE GLASS.

In proportion to the number of lights, *matting* for shading and sheltering must be at hand. The usual mode of covering at night is by laying on mats, and over these litter, in thickness according to the severity

of the season. Some gardeners lay hay immediately in contact with the glass, and over this the mats. Every person conversant with these modes of shelter, is aware of their inconvenience; in rainy weather they soon become wet, and rapidly chill the beds; added to which, the trouble caused in placing and removing them, and the danger to the glass from the stones laid on as a resistance to the wind, are by no means inconsiderable. Mr. Seton, to obviate these inconveniences, employs a particular covering, which he constructs of four laths, two of such a length as to exceed a little that of the frame, and the others in a similar manner that of its breadth; these are bound together at right angles, so as to form a parallelogram of the form and size of the frame, and pieces are bound across this at a foot apart from each other. Over this a mat is spread, and over the mat a layer of straw is fastened, laid on level like thatch, from three to six inches thick, as may appear necessary. If the breadth of the frame is or exceeds four feet, it is best to have the covering in two parts, otherwise it becomes weak and unwieldy. These pannels, as they may be called, Mr. Seton also employs in preserving tender plants through the winter. A pit or frame earthed up all round, and covered with one of them, or two or three if needful, is completely impervious to frost*.

ROTATION OF CROPS.

The order in which successive crops are grown on the same compartment has very considerable influence in prolonging the continuance of the soil in fertility. Some vegetables, as onions, and carrots, are extremely impoverishing to a soil, whilst lettuces are but in a small degree prejudicial.

* Trans. Hort. Soc. Lond., vol. iii. p. 296.

It is, therefore, obvious, that a succession of exhausting crops should be never grown on the same bed, however plentiful manure may be, not merely because abundance is no excuse for a want of economy, but that fresh applied dung is not so immediately beneficial as those remains of organised matters, which, by long continuance in the soil, have become impalpably divided, and diffused through its texture, and of which each succeeding crop consumes a portion. Those plants in general are the least exhausting which have the largest surface of leaves, and vice versâ, because the first are not only possessed of a larger portion of aqueous than solid matter than the latter, but also are enabled to obtain a greater quantity of their food from the atmosphere. It may be objected, to many crops included by this rule, and especially to turnips, that they require a soil of extreme fertility; but this is only an apparent anomaly, for, although the turnip, for example, requires a rich soil, it is only because it requires a regular supply of moisture: neither will a tenacious soil therefore be beneficial; on the contrary, a superfluity or deficiency, according to the season, being then afforded, decay or immaturity is induced.

There are many other contingencies which should regulate the rotation of crops. The roots of different plants strike in different directions and to different depths; and, as their constituents vary, absorb different matters. Deep-rooting plants, therefore, should be succeeded by such as spread but a little below the surface. Perennials always by annuals. Crops left for seed, or those that are of a dry solid texture, by such as are succulent and juicy. But, above all, the same species of plant should never be grown in successive crops upon the same ground. This is not even palliated by the excuse that manure is abundant, for, as Sir H. Davy observes, "though the general com-

position of plants is very analogous, yet the specific difference in the products of many of them prove that they must derive different materials from the soil: and though the vegetables having the smallest systems of leaves will proportionably most exhaust a soil of *common* nutritive matter, yet particular vegetables, when their produce is carried off, will require peculiar principles to be supplied to the land which produces them *." It is known to every cultivator of soil, that land soon becomes *tired* of the same crop; in many instances peculiar diseases are induced by the repetition. The most beneficial plan of rotation, appears to be that where an exhausting and non-exhausting crop alternately succeed each other; for example,

Onions.	Turnips.
Lettuce.	Peas.
Carrots.	Potatoes.
Manure.	Manure.

Mr. Kelly, of Airthrey Castle, Scotland, says, that on poor ground the rotation he finds best is celery; 2nd season, cauliflowers and red beet; 3rd, onions; 4th, German greens or peas. By digging deep and manuring abundantly for celery, the ground is brought into such fine tilth, that the whole rotation is often gone through without any further addition, and without failing in any of the crops †.

* Lect. on Agric. Chem., p. 358.
† Caled. Hort. Mem., vol. i. p. 297.

AGARICUS.

From Agaria, a city, or Agarus, a river of Sarmatia, now Malamonda.

To produce mushrooms artificially, beds variously constructed are employed; and from the numerous modes which have been invented and adopted for their production, some accompanied with extraordinary expense, it is obvious that this "voluptuous poison" is with us, as with the Romans, in high estimation.

TIMES OF FORMING THE BEDS.

Beds may be constructed from January until the beginning of May, for spring and summer production; and from July to the close of the year, for autumn and winter.

CONSTRUCTION.

A bed is usually constructed of stable dung, &c., prepared as already directed. It is made in the form of the roof of a house, four or five feet wide at the base, narrowing to an apex, which should be rather rounded, of three or four feet high; the length as required, from ten to fifty feet. The dung being laid in alternate rows, with clayey loam, from which the largest stones have been sorted, each layer of dung to be a foot thick, and of mould four inches, so that three layers of each will be sufficient to complete the requisite height. The dung must be well separated and mixed, and beat, but not trod down. When completed the bed must be covered with litter or other light covering, to keep out the wet, as well as to prevent its drying; clean dry straw will do, but sweet hay, or matting, is to be preferred.

SITUATION.

The bed should be made in a dry sheltered situation, and on the level ground in preference to founding it in a trench, which prevents the spawning being performed completely to the bottom, and guards against the settling of water, which may chill it. If the site is not dry it must be covered with stones, clinkers, &c., to act as a drain, for nothing destroys mushrooms sooner than excessive moisture, except an extreme of heat or cold. To obviate the occurrence of these unfavourable circumstances, it is by far more preferable to construct it under a shed. If it is constructed in a shed, it may be built against one side, sloping downwards from it; this is the practice of Mr. Rogers, who makes it two feet high at the back, and one in front*. To proceed with greater certainty during the winter, a fire flue may pass beneath the bed; but it is by no means absolutely necessary, for, by the due regulation of covering, it may always be kept of sufficient temperature.

MANAGEMENT.

The spawn must not be inserted before the temperature has become regular and moderate.

TEMPERATURE.

The minimum is 50° and the maximum 60°. As soon as the violence of the heat has abated, which it will in two or three weeks, though sometimes it will subside in eight or ten days.

SPAWNING.

The large lumps of spawn, being broken into moderately small pieces, are to be planted on both sides

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* Trans. Hort. Soc. Lond. vol., iv. p. 474.

of the bed and ends, if it is hipped; each fragment just beneath the surface of the dung, in rows six or eight inches apart each way. Some gardeners erroneously scatter the spawn irregularly over the surface. Fine rich loam, rather light than otherwise, is then to be put on two inches deep, the stones being carefully separated. Some gardeners, endeavouring to imitate the natural mode of growth, spread an inch in depth of mould over the beds, in which they set the spawn, and then gently cover it with half an inch more. Others lay a ledge of mould, four inches high and two thick, all round the bed; upon this, close to the dung, they lay the spawn; then a second ledge, six inches, of similar thickness, on this they set another row of spawn, and so proceed until the bed is finished; but this has no advantage over the first mode described, and is much more tedious. Lastly, a covering of straw, six or twelve inches thick, according to the temperature, is to be laid on, and continued constantly. When the earthing is finished, the surface must be gently smoothed with the back of the spade, which fixes it properly, and if in the open air throws off any excessive rain. If after the bed has been spawned and covered up, the heat appears to be renewed in any considerable degree, the greatest part of the covering must be removed, but restored again during rain, if the bed is not under cover; and to ugard against this contingency it is a good practice to mould over only two-thirds of the bed at first, leaving the top uncovered, to serve as a vent for the heat and steam, but when all danger is passed it may then be completed.

TIME OF PRODUCTION.

In four or five weeks after spawning, in spring and autumn, the bed should begin to produce, but not until much later in summer and winter; and if kept

dry and warm will continue to do so for several months. A gathering may take place two or three times a week, according to the productiveness of the bed. It sometimes happens that beds will not come into production for five or six months, they should not therefore be impatiently destroyed.

WATERING.

In autumn the bed will not require water until the first crop is gathered, but it is then to be repeated after every gathering: a sprinkling only is required. In spring and summer, during dry weather, the same course is to be pursued. As excessive or unequal moisture is studiously to be avoided, the best mode of applying the water is to pour it through a rose pan on to a thin layer of hay, which has previously been spread over the bed, and thus allowed to percolate by degrees. In winter, as waterings are not allowable, to keep the mould moist hot fermenting mulch may be put on outside the covering. If the bed is in the open ground, in a warm day succeeding to wet weather, it may be left uncovered for not more than two or three hours. During excessive rains the additional covering of mats, &c., must be afforded; and on the other hand, if a moderate warm shower occurs during summer after excessive droughts, it may be fully admitted by taking off the covering.

MODE OF GATHERING.

In gathering, the covering being carefully turned off, only such are to be taken as are half an inch or more in diameter, before they become flat, but are compact and firm. Old mushrooms especially should be rejected for the table, as it is found that some which are innoxious when young, become dangerous

when tending to decay; they also then lose much of their flavour. Each individual is detached by a gentle twist completely to the root; a knife must never be employed, for the stumps left in the ground, decay and become the nursery of maggots, which are liable to infect the succeeding crop.

OTHER MODES OF CULTIVATION.

Some gardeners merely vary from the preceding, by building entirely of dung, without any layers of earth. A third mode is as follows: a sufficient quantity of the droppings of hard fed horses, entirely free from litter, and well dried, being collected, is to be laid, of the requisite length and breadth, four or six inches thick, in a dry sheltered situation, and suffered to remain for eight or ten days open to the air, as fermentation is to be avoided, then earth is laid on two inches thick; a second and third layer of each, with similar precaution, are added, contracting either to a pyramidal or rounded top gradually; no spawn is employed. Being left to itself it will produce mushrooms in four or five weeks later than if spawn was employed, but is in general more productive and lasting; and although it of course will occasionally fail in producing at all, yet it must not be hastily broken up. No water must be given until spawn is observable, and then with the requisite precautions.

Many gardeners grow mushrooms in the same bed with their melons and cucumbers. The following is the mode adopted by the Rev. W. Williams, of Westbere, near Canterbury: he obtains, he says, good crops without detriment to either. The spawn is inserted in the mould and on the hills of the beds as soon as the burning heat is passed. In September or October, when the bines of the plants decay, the bed is then carefully cleaned, the glasses put on and kept close,

and when the mould becomes dry, water is frequently but moderately given, as well as every gentle shower admitted when necessary. A gentle heat is thus caused, and the produce extraordinarily abundant, frequently two bushels from a frame ten feet by six, and individuals have been produced two pounds in weight. Mushrooms are thus produced without any trouble but the giving moderate waterings, until frost prevents their vegetation; the glasses, if wanted, are then removed, and the beds covered lightly with straw, but not otherwise. The warm showers of the ensuing spring will again cause an abundant production, as also in the autumn, if left; but the beds are generally broken up for the sake of the dung, and the spawn collected and dried*.

Mr. W. Wales, gardener to Col. Duff, of Fetteresso Castle, Scotland, employs hampers or boxes, containing about four inches depth of fresh, dry stable dung, or, in preference, of a mixture of three barrow loads of horse-dung, and one perfectly dry cow-dung, well pressed in, and set in some situation where neither damp nor frost can enter. After two or three days, or as soon as heat is generated, the spawn may be inserted; a mushroom brick to be broken into three equal parts, and each fragment to be laid four inches asunder on the surface of the dung: after six days an inch and a half depth of fresh dung to be beaten down as before. In the course of a fortnight, or as soon as it is found that the spawn has run nearly through the whole of the dung, mould must be applied two inches and a half thick, and the surface made level. This mould must be prepared six months before wanted, by laying alternate layers of six inches depth of fresh stable dung, and three inches of light mould to such an extent, as may be deemed necessary

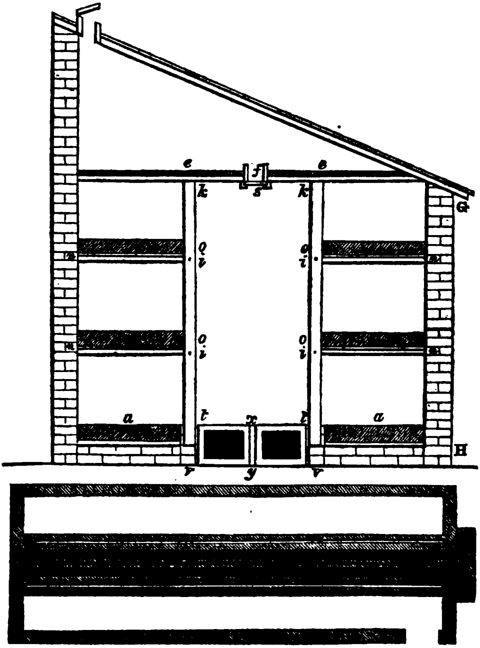
* Trans. Hort. Soc. Lond., vol. iii. p. 6.

for the supply of a year; in six months the dung will be sufficiently decayed, and the whole may then be broken together, and passed through a garden sieve for use. In five or six weeks the mushrooms will begin to come up, and, if the mould appear dry, may then be gently watered; the water being slightly heated. Each box will continue in production six or eight weeks. Another mode mentioned by Mr. Wales produces them more slowly, and more sparingly, yet of superior flavour:—he has boxes, or hampers, having rather more than an inch in thickness of the compost laid on their bottom, on this are laid fragments of the bricks, each being broken into ten pieces, as thick as they can lie; these are then covered with three and a half inches of the above described mould, well pressed down. When the surface appears dry, tepid water must be applied, but in nearly double the quantity required in the preceding mode. The mushrooms will appear in four or five weeks*.

Mr. J. Oldaker, late gardener to the Emperor of Russia, has introduced a house purposely constructed for the growth of the mushroom, which he first erected at Petersburg, and in this country at Spring Grove, the seat of the late Sir J. Banks, in both instances with signal success, and in the latter instance it has called forth the unqualified recommendation of the Committee of the Horticultural Society. In Russia the mushroom could hardly be obtained without the regular protection and warmth of such a structure; and for cleanliness and certainty of success it is equally superior in this country, but with proper care there is not much doubt, that, with the protection of a shed, as abundant and fine crops may be obtained without this expensive building and management. The house is found of great use in

* Mem. Caled. Hort. Soc., vol. ii. p. 436 et seq.

storing brocoli during the winter, from the severe climate of Northern Europe, &c.; but as this can readily be effected in this country by other means, the hint that it is otherwise useful is sufficient. It is usually built against the back wall of a forcing house, as in the annexed plan, but if built unconnected with another



building the only necessary alteration is to have a

hipped instead of a lean-to roof. The outside wall, G H, should be eight feet and a half high for four heights of beds, and six feet and a half for three heights; the width ten feet within the walls, which is most convenient, as it admits shelves three feet and a half wide on each side, and a space up the middle three feet wide for a double flue, and wall upon it. The walls should be nine inches thick, and the length of the house as may be judged necessary. When the outside of the house is finished, a floor or ceiling is made over it, as high as the top of the outside walls, of boards one inch thick, and plastered on the upper side, *e e*, with road sand, well wrought together, an inch thick; square trunks, *f*, being left in the ceiling, nine inches in diameter, up the middle of the house at six feet apart, with slides, *s*, to ventilate with when necessary. Two single-brick walls, *v v*, each five bricks high, are then to be erected at three feet and a half from the outside walls, to hold up the sides of the floor beds, *a a*, and form at the same time one side of the air flues, *t t*, leaving three feet up the middle, *t x t*, for the flues. Upon these walls, *v v*, are to be laid planks four inches and a half wide, and three inches thick, in which are to be mortised the standards, *l k*, which support the shelves. These standards to be three inches and a half square, and four feet and a half asunder, fastened at the top, *k k*, into the ceiling. The cross bearers, *i n*, *i n*, which support the shelves, *o o*, must be mortised into the bearers and into the walls; the first set of bearers being two feet from the floor, and each such succeeding one to be at the same distance from the one below it. The shelves, *o o*, are to be of boards one inch and a half thick; each shelf having a ledge in front, of boards one inch thick and eight inches deep, to support the front of the beds, fastened outside the standards. The flue, to com-

mence at the end of the house, next the door, and running the whole length to return back parallel and communicate with the chimney, *s*; the walls of the insides to be the height of four bricks laid flat, and six inches wide; this will allow a cavity, *t*, on each side betwixt the flue and the walls, which are beneath the shelves, and one, *x y*, up the middle betwixt the flues, two inches wide, to admit the heat from their sides into the house. This middle cavity, *x y*, should be covered with tiles, leaving a space of one inch betwixt each. The top of the flue including the covering should not be higher than the walls that form the fronts of the floor beds. The wall itself is covered with three rows of tiles, the centre one covering the cavity, *x y*, as before mentioned, the outside cavities, *t u*, are left uncovered.

As the compost, the formation of the beds, &c., are very different from the common practice, I shall give a connected view of Mr. Oldaker's directions. The compost employed is fresh horse-dung, which has neither been subject to wet nor fermentation, cleared of the long straw, but one fourth of the short litter allowed to remain, with one fourth of dry turf mould, or other fresh earth: this enables the bed to be made *solid and compact*, which is so congenial to the growth of mushrooms. The beds are to be made by placing a layer of the above compost three inches thick on the shelves and floor, which must be beat as close as possible with a flat mallet, fresh layers being added and consolidated until the bed is seven inches thick and its surface as level as possible. If the beds are thicker the fermentation caused will be too powerful, or, if much less, the heat will be insufficient for the nourishment of the spawn. As soon as the beds intimate a warmth of 80° or 90° they are to be beat a second time to render them still more solid, and holes made with a dibble three inches in diameter

and nine apart through the compost in every part of the beds; these prevent too great a degree of heat arising and causing rottenness. If the beds do not attain a proper heat in four or five days after being put together, another layer two inches thick must be added; if this does not increase the heat, part of the beds must be removed and fresh horse droppings mixed with the remainder. The spawn is to be inserted in three or four days after making the holes, when the thermometer indicates the desired degree of heat, the insides of the holes are dry, and while the heat is on the decline. Every hole is to be filled either with lumps or small fragments well beaten in, and the surface made level. In a fortnight, if the spawn is vegetating freely, which it will if not damaged by excess of heat or moisture, and the beds are required for immediate production, they may be earthed over, but those for succession left unearthed three or four weeks in summer, and four or five in winter. If the spawn is introduced in hot weather, air must be admitted as freely as possible until it has spread itself through the beds, otherwise these will become spongy, and the crop be neither good nor abundant. The mould employed should be maiden earth, with turf well reduced, neither too dry, nor too wet, otherwise it will not be capable of being beat solid; it must be laid regularly over the beds two inches thick. From the time of moulding the room is to be kept at a temperature of 50° or 55°, if higher it will weaken or destroy the spawn; if lower it will vegetate slowly, and if watered in that state numbers of mushrooms will be prevented attaining perfection. Water must be applied with extreme caution, being nearly as warm as new milk, and sprinkled over the beds with a syringe or small watering-pot. Cold water destroys both the crop and the beds; if suffered to become dry, it is better

to give several light than one heavy watering. Beds thus managed will bear for several months, and a constant supply kept up by earthing one bed or more every two or three months. If when in full production the mushrooms become long stemmed and weak, the temperature is certainly too high, and air must be proportionately admitted. As the beds decline, to renovate them the earth must be taken off clean, and, if the dung is decayed, they must be re-formed, any good spawn being preserved that may appear; but if the beds are dry, solid, and full of good spawn, a fresh layer of compost, three or four inches thick, must be added, mixed a little with the old, and beat solid as before. Mushrooms may be grown in a cellar, or other vaulted place, with equal success, and not unfrequently with a greater advantage, the same rules being adopted, but no fire is necessary and less water*.

SPAWN WHERE TO BE FOUND.

Spawn is constituted of masses of white fibres, arising from the seeds of mushrooms, of which it has the exact smell, that have fallen into situations suitable for their germination. These situations, from which it is to be obtained, are stable dung-hills; dungy-horse-rides in stable-yards; horse-mill tracks; dry spongy composts: the droppings of hard-fed horses produce it in greater abundance than the dung of any other animal; in the neighbourhood of old privies; more sparingly under sheds where horses, oxen, or sheep have been kept. The dung of the two latter affords it in greater perfection than that of grass-fed horses; it has also been found in pigeons' dung †; but the most certain mode of obtaining it

* Trans. Hort. Soc. Lond., vol. ii., p. 336.
† Trans. Hort. Soc. Lond., vol. iv., p. 473.

is to open the ground about mushrooms growing in pastures, though it is said not to be so productive.

TIME OF COLLECTING.

It must be collected in July, August, and September, being reckoned in the greatest perfection in this last month; it may be found, however, and should be collected when it appears, in the spring. It generally occurs spread through the texture of cakes, or lumps of the dry rotted dung, or in lumps of the earth. These must be collected as entire as possible, and preserved in a heap under cover, and enveloped with straw or mats. It must especially be a very dry situation, and, if the spawn itself is damp, be gradually dried before heaping; a current of air passing through the shed is of great utility. If kept dry, spawn may be preserved three or four years; if damp, it will either vegetate before being planted, or putrefy. Spawn must not be so far advanced in vegetation as to appear in threads or fibres, for when in this state it is no longer applicable to a mushroom bed; it may produce a mushroom if left to itself, but otherwise is useless. Spawn proper for inserting in a bed should have the appearance of indistinct white mould *.

MAY BE RAISED.

Mr. Wales, who has been before mentioned, always obtains spawn artificially; that it is capable of being so raised has been long known and practised †. The following is the manner in which he obtains it. Two barrow loads of cow-dung, not grass-fed, one load of sheep's dung, and one of horse's, well dried, and broken so small as to pass through a coarse sieve, are well mixed and laid in a conical heap, during March, in a dry shed, being

* Trans. Hort. Soc. Lond., vol. iv., p. 474.

† Hist. de l'Acad. for 1707, p. 47.

well trod as it is formed, to check its heating excessively; this heap is covered with hot dung four inches thick, or only with mats if the shed is warm, for here, as in all the stages of growth, the heat should only range between 55° and 60°. In about a month the heap is examined; and if the spawn has not begun to run, which is shown by indistinct white fibres pervading its texture, another covering of equal thickness to the first is applied over the old one; in another month it will indubitably make its appearance, the time varies from three to ten weeks*.

MAY BE INCREASED.

If a small quantity of spawn only can be collected it may be increased in either of the two following manners, the first of which is chiefly recommendable on account of its simplicity and facility of adoption. Small pieces of the spawn may be planted a foot asunder, just beneath the surface of the mould of a cucumber bed constructed in the spring. In about two months the surface of the spawn will assume a mouldy appearance, it may then be taken up with the earth adhering to it, and when dried stored as before directed.

The second mode is variously practised. In the course of May a heap of the droppings of cows, sheep and horses, or any one or two of them, without the admixture of any undecomposed straw, is to be collected, and one-fifth of road-scrapings, with one-twentieth of coal ashes added, the whole being mixed together with as much of the drainings from a dunghill as will make it of the consistency of mortar; being well incorporated, it is then to be spread in a dry, sheltered, airy place, on a smooth surface, six inches thick, beat firm and smooth with a spade. When become of the consistency of clay, it is to

* Caled. Hort. Mem., vol. ii., p. 431.

be cut into slabs about eight inches square, a hole punched half through the middle of each, and piled to dry, an opening being left between every two bricks. When perfectly dry, a fragment of spawn is to be buried in the hole previously made: it will shortly spread through the whole texture of the slabs, if kept in a warm dry place, when each may be broken into four of five pieces, and when quite dry laid on shelves separate, and not in heaps, otherwise a bed will be formed for the spawn to run in *. Mr. Wales recommends the composition to consist of three parts horse-dung, without litter; two of rotten tree leaves; two of cow-dung; one of rotten tanners' bark, and one of sheep-dung. These being mixed to the consistency of mortar are moulded in small frames like those used by brickmakers, six inches long, four broad, and three deep. Three holes to be made half through the bricks, an inch apart, with a blunt dibble, for the reception of the spawn; they should be put on boards, for the convenience of moving abroad during fine days, as they must be made perfectly dry, which they often appear to be on the outside, when they are far otherwise internally. Before they are perfectly dry they require great care in handling and turning, from their aptitude to break; but in about three weeks, if dry weather, when perfectly exsiccated, they become quite firm. To pervade them with the spawn, a layer of fresh horse litter which has laid in a heap to sweeten as for a hotbed, must be formed six inches thick in a dry shed; on this a course of the bricks is to be laid, and their holes completely filled with spawn, and, as the bricks are laid in rows upon each other, the upper side of each is to be scattered over with some of the same; the bricks are not placed so as to touch, so that the heat and steam of the

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* Mawe's Abercrombie.

dung may circulate equally and freely. The heap is to terminate with a single brick, and, when completed, covered with a layer six inches thick of hot dung, to be reinforced with an additional three inches, after a lapse of two weeks; the spawn will generally have thoroughly run through the bricks after another fortnight, if, however, upon examination, this is not found to be the case, they must remain for ten days longer. The bricks being allowed to dry for a few days before they are stored, will then keep for many years *.

Mr. Oldaker recommends the bricks to be made of fresh horse droppings mixed with short litter, to which must be added one-third of cow's dung and a small portion of earth to cement them together. The spawn to be inserted when they are half dry †.

QUANTITY REQUIRED.

One bushel of spawn is required for a bed five feet by ten, two bushels for one double that length, and so on in proportion.

ALLIUM.

Derivation uncertain, probably from αγλιθις, a head of garlic.

Of this genus, there are eight individuals that demand the gardener's care.

SOIL AND SITUATION.

They require a rich friable soil on a dry substratum; a situation enjoying the full influence of the sun,

* Mem. Caled. Hort. Soc., vol. ii., p 433.
† Trans. Hort. Soc. Lond., vol. ii., p 345.

and entirely free from trees, which are very inimical to them, especially to those which have to stand the winter. If the soil be poor, or exhausted, abundance of dung should be applied in the preceding autumn or winter, and the ground thrown into ridges. By these means it becomes well decomposed and incorporated with the soil; for rank unreduced dung is generally injurious, engendering decay, and inducing maggots; if therefore the application of manure is neglected until the spring, it should be taken from an old hotbed, or other source whence it is to be had in a thoroughly putrescent state, and turned in only to a moderate depth. Sea sand, particularly if the ground is at all tenacious, is advantageously employed: coal ashes, and especially soot, are applied with particular benefit. In digging over the ground small spits only should be turned over at a time, that the texture may be well broken and pulverised. A considerable degree of attention is required from the difficulty of giving the requisite degree of firmness to light soils, which if rich are well suited to the growth of these vegetables, without carrying it to excess. Old, soft, or light sandy soils, Mr. A. Gorrie, of Rait, recommends to be dug rough in October, and about January to have a top dressing of cow-dung applied and left on, to have its fertilising matters washed in until the time of sowing, when as much as can be is to be raked off, and, without digging, the seed sown, trod in, and covered with earth from the alleys. By this management soils will produce good crops which before were annually destroyed by the maggot *. Onions for pickling, as well as those to stand the winter, should be grown on light poorer soils, which cause the first to be small in the bulb, and the latter not growing so luxuriant to withstand the winter better.

* Mem. Caled. Hort. Soc., vol. ii., p. 292.

ALLIUM CEPA.—ONION.

Cepa from caput, a head, on account of the form of the bulb.

DESCRIPTION.

There are fourteen distinct varieties of this vegetable, as appears from the description given by Mr. C. Strachan, gardener to the Horticultural Society of London *.

VARIETIES.

1. Silver skinned onion.
2. Early silver skinned.
3. True Portugal.
4. Spanish.
5. Strasburg.
6. Deptford.
7. Globe.
8. James's Keeping Onion.
9. Pale-red.
10. Yellow.
11. Blood-red.
12. Tripoli.
13. Two-bladed.
14. Lisbon.

TIME OF SOWING.

The onion is raised from seed, which may be sown for the first main crop towards the close of February, if dry open weather, otherwise only a small portion in a warm dry situation. The principal crop, how-

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* Trans. Hort. Soc. Lond., vol. iii., pp. 371—6.

ever, must be sown during March, it being kept in mind that the close of February is to be preferred, for the earlier the seed is inserted the finer will be the bulbs: main crops may even be inserted as late as the beginning of April, and, at its close, a small sowing to draw young in Summer, and for small bulbs to pickle; again in July and early in August for salads in autumn; and, finally, in the last week of August, or early in September, to stand the winter for spring and beginning of summer.

MODE OF SOWING.

The seed is sown thinly, broadcast, and regularly raked in. An ounce of seed is abundantly sufficient for a rood of ground, especially for the main crops, as they should never be allowed to grow to a size fit for salads without thinning. No other seed ought to be sown with it, for the practice of stealing a crop, unless every spot of ground is an object, is detrimental to both crops, without the slightest advantage to compensate. The beds should be divided by narrow alleys into portions about four feet wide, for the convenience of cultivation.

CULTIVATION.

In about six weeks after sowing, the plants will be of sufficient size to allow the first thinning and small hoeing, by which they are to be set out about two inches apart; if this is performed in dry weather it will keep the beds free of weeds for six weeks longer, when they must be hoed a second time, and thinned to four inches apart, and now, where they have failed, the vacancies may be filled up by transplanting some of those thinned out into the places, the best time for doing this is in the evening, and water must be given for several successive nights. In trans-

planting, the root only is to be inserted, and no part of the stem buried, for there is very good reason to believe that naturally the bulb grows entirely upon the surface, and that growing within the mould is a great cause of their not keeping well. After the lapse of another month they must be thoroughly gone over for the last time, the weeds eradicated, and the plants thinned to six inches asunder; after this they in general only require to be weeded occasionally by hand, they must, however, be kept completely free from weeds, and the stirring of the surface which the hoe effects is very beneficial. In order to prevent their running too much to blade, it is a good practice early in July, before the tips change to a yellow hue, to bend the stems down flat upon the bed, which not only prevents it, but causes the bulbs to become much larger than they otherwise would. The bend should be made about two inches up the neck.

GATHERING AND STORING.

About the close of August the onions will have arrived at their full growth, which may be known by the withering of the foliage, by the shrinking of the necks, and by the ease with which they may be pulled up. As soon as these symptoms appear, they must be taken up, the bed being frequently looked over, for, if the whole crop is waited for, the forwardest, especially in moist seasons, are apt again to strike root. They should be spread on mats, &c., in the sun, frequently turned, and removed under shelter at night. In two or three weeks, when the roots and blades are perfectly withered and void of moisture, and the bulbs become firm, they are fit for storing, being housed in dry weather and carefully preserved from bruising; previous to doing this, all mould and refuse must be removed from them, for these are apt to induce decay, and spread contagion to all near

them; to prevent this as much as possible, all faulty ones should be rejected: in the store-house they must be laid as thin as may be, and looked over at least once a month. Notwithstanding every precaution many will decay, and more sprout, especially in mild winters, therefore, to preserve some for late use, it is useful to sear the roots and the summits with a hot iron, care being taken not to scorch the bulb.

ADDITIONAL DIRECTIONS AND MODES OF CULTIVATION.

For the winter standing crop the only additional directions necessary, are to tread in the seed regularly before raking, if the soil, as it ought to be, is dry and light. They must be kept constantly clear of weeds, as well as of the fallen leaves of trees, which cause them to spindle and become weak, but they need not be thinned, as they serve as protections for each other. Early in spring they are to be weeded, and, as may be necessary, transplanted for bulbing. There are several modes of cultivation lately introduced or revived, which produce onions of superior size and goodness. The great obstacle to the production of fine onions in this country is the want of a sufficient continuance of warm weather; or at least the inclemency of the early part of the year prevents the insertion of the seed until so late, that the most genial season to vegetation passes away whilst the plants are in their infancy; it is the obviating this unfavourable circumstance that causes the superiority of the several plans hereafter detailed.

It is a practice that originated in America, and which has met with the decided approval of Mr. Knight and others*, to sow in May, to cultivate the

* Trans. Hort. Soc. Lond., vol. i., p. 157; vol. iii., p. 404.

plants as in the other crops, and, in October, the bulbs being of the size of nuts are to be taken up, dried and housed as directed for the full grown bulbs. About the middle of the following March, they must be planted out in rows six inches apart each way, and posteriorly cultivated the same as the other crops. If sown earlier than May, they run to seed when transplanted. Another mode nearly as efficacious, and which I understand has been practised for a great length of time in the south of Essex, is to sow in the latter part of August, to stand the winter, and in March, early or late, according to the forward growth of the seedlings, to be planted out in rows at the before directed distance, and cultivated as usual.

In Portugal they sow in a moderate hotbed during November or December, in a warm situation, with a few inches of mould upon it; and the plants are protected from frost by hoops and mats; in April or May, when of the size of a swan's quill, they are transplanted into a light, rich loam, well manured with old rotten dung, to bulb *.

It would seem from the practice of Mr. Macdonald, gardener to the Duke of Buccleugh, at Dalkeith, that transplanting alone is of great benefit. "His soil," he says, "is not very favourable to the growth of the onion, being light and thin; and it was not until after many experiments he was able to obtain fine bulbs, and which he at length accomplished by sowing in the end of February, and about April transplanting them at the usual distance in drills, first dipping the root into a puddle, consisting of one part soot and three parts earth, mixed with water; the work being performed in moist weather †. The

* Trans. Hort. Soc. Lond., vol. iii., p. 68.

† Mem. Caled. Hort. Soc., vol. i., p. 112.

puddle, as is observed by Mr. Sinclair, can be of no other use than to assist the rooting of the plants.

TO SAVE SEED.

To obtain seed, some old onions must be planted during February, or early in March. The finest and firmest bulbs being selected, and planted in rows ten inches apart each way, either in drills or by a blunt ended dibble, the soil to be rather poorer, if it differs at all from that in which they are cultivated for bulbing. They must be buried so deep that the mould just covers the crown. Early in spring their leaves will appear. If grown in large quantities a path must be left two feet wide between every three or four rows, to allow the necessary cultivation. They must be kept thoroughly clear of weeds, and when in flower have stakes driven at intervals of five or six feet on each side of every two rows, to which a string is to be fastened throughout the whole length, a few inches below the heads, to serve as a support, and prevent their being broken down. The seeds are ripe in August, which is intimated by the husks becoming brownish; the heads must then be immediately cut, otherwise the receptacles will open and shed their contents. Being spread on cloths in the sun, during the day, and taken under cover every night and during inclement weather, they soon become perfectly dry, when the seed may be rubbed out, cleaned of the chaff, and, after remaining another day or two, finally stored. It is of the utmost consequence to employ seed of not more than one year old, otherwise not more than one in fifty will vegetate.

The goodness of seed may be easily discovered by forcing a little of it in a hotbed, or warm water, a day or two before it is employed: a small white point will soon protrude if it is fertile.

POTATO, OR UNDER-GROUND ONION.

DESCRIPTION.

This species of Allium has received the above appellations, on account of its producing a cluster of bulbs or offsets, in number from two to twelve, and even more, uniformly beneath the surface of the soil. From being first introduced to public notice in Scotland by Captain Burns of Edinburgh, it is there also known as the Burn onion.

VARIETIES.

There evidently appear to be two varieties of this vegetable, one of which bears bulbs on the summit of its stems, like the tree onion, and the other never throwing up flower stems at all *. One variety is much larger than the other, and this vegetates again as soon as ripe.

Both varieties are best propagated by offsets of the root, of moderate size, for if those are employed which the one variety produces on the summit of its stems, they seldom do more than increase in size the first year, but are prolific the next; this also occurs if very small offsets of the root are employed †.

TIME AND MODE OF PLANTING.

They may be planted during October or November, or as early in the spring as the season will allow, but not later than April. In the west of England, assisted by their genial climate, they plant on the shortest

* Mem. Caled. Hort. Soc., vol. iii. p. 216. Trans. Hort. Soc. Lond., vol. iii. p. 305.

† Mem. Caled. Hort. Soc., vol. iii. p. 216.

and take up on the longest day *. They are either to be inserted in drills, or by a blunt dibble eight inches apart each way, not buried entirely, but the top of the offset just level with the surface. Mr. Maher, gardener at Arundel Castle, merely places the sets on the surface, covering them with leaf mould, rotten dung, or other light compost †. The beds they are grown in are better not more than four feet wide, for the convenience of cultivation.

CULTIVATION.

The only cultivation required is to keep them clear of weeds. The practice of earthing the mould over them when the stems have grown up is unnatural, and by so doing the bulbs are blanched and prevented ripening perfectly, on which so much depends their keeping. So far from following this plan, Mr. Wedgewood of Betley, recommends the earth always to be cleared away down to the ring from whence the fibres spring, as soon as the leaves have attained their full size and begin to be brown at the top, so that a kind of basin is formed round the bulb ‡. As soon as they vegetate, they intimate the number of offsets that will be produced, by showing a shoot for each.

They attain their full growth towards the end of July, and become completely ripe early in September; for immediate use they may be taken up as they ripen, but for keeping, a little before they attain perfect maturity, which is demonstrated by the same symptoms as were mentioned in speaking of the onion §.

* Trans. Hort. Soc. Lond., vol. iii. p. 305.

† Ibid.

‡ Trans. Hort. Soc. Lond., vol. iii. p. 403.

§ Mem. Caled. Hort. Soc., vol. i. p. 343.

CIBOULE, OR WELSH ONION. (ALLIUM FISTULOSUM.)

DESCRIPTION.

This is a perennial, never forming any bulb, but is sown annually to be drawn young for salads, &c.; on account of its strong taste it is greatly inferior to the common onion for this purpose, but from its extreme hardiness in withstanding the severest frost, it may be cultivated with advantage as a winter standing crop for spring use.

VARIETIES.

In France two varieties are in cultivation; the white and the red; the first of which is the one in general use here.

CULTIVATION.

As it may be sown at all times in common with the onion, and is similarly cultivated, except that it may be sown thicker and only thinned as wanted, the directions given for that vegetable will suffice. The blade usually dies away completely in winter, but fresh ones are thrown out again in February or March.

TO OBTAIN SEED.

To obtain seed some of the roots must be planted out in March, six or eight inches asunder. The first autumn they will produce but little seed; in the second and third, however, it will be produced abundantly. If care is taken to part and transplant the roots every two or three years, they may be multiplied and will remain productive for many years, and afford much better seed than that from one year old roots.

SCALLIONS.

There is good reason for concluding, as Mr. T. Milne, of Fulham, ingeniously explains, that by a confusion of names, arising from similarity of appearance, this vegetable is the true Scallion of Miller and others, whilst the hollow Leek of Wales is the true Welsh Onion*, for the description of Scallion as given by Miller, accords exactly with that of the Welsh Onion; and as he describes it as a distinct variety, we are reduced to the dilemma of receiving this explanation or considering the variety as lost, for from Miller's known accuracy it is impossible to consider that he was deceived. At present all Onions that have refused to bulb, and formed lengthened necks and strong blades in spring and summer, are called Scallions.

ALLIUM SATIVUM.—GARLIC.

DESCRIPTION.

Garlic is a hardy plant, capable of growing in almost any soil.

MODE AND TIME OF PLANTING.

It is generally propagated by the cloves obtained by parting the root, but may be raised from the bulbs produced on the stems. The planting may be performed any time in February, March and early in April, but the middle of the second is the usual time of insertion. A single clove to be placed in each one of holes made six inches apart and one and a half deep, in straight lines, six inches distant from each other, care being taken to set the root end downwards; to do this with the greatest facility it is the best practice to thrust the finger and thumb, holding a clove between them, to the requisite depth, without any previous hole being made.

* Trans. Hort. Soc. Lond. vol. iii. p. 418.

CULTIVATION.

The only cultivation required is to keep them clean of weeds, and in June the leaves to be tied in knots, to prevent their running to seed, which would greatly diminish the size of the bulbs. A few roots may be taken up as required in June and July, but the whole must not be lifted until the leaves wither, which occurs at the close of this last mentioned month, or in the course of August. It is usual to leave a part of the stalk attached, by which they are tied into bundles, being previously well dried by exposure to the sun and air, for keeping during the winter.

ALLIUM PORRUM.—LEEK.

DESCRIPTION.

The Leek is a hardy biennial, for although it attains perfection in size and for culinary purposes the first year, it does not run to seed until the second, the perfecting of which it also often survives.

The whole plant is eaten, being employed in soups, &c., and is by some persons boiled and eaten with meat.

VARIETIES.

There are four varieties; the Musselburgh, and the large London Leek, which are by far the best; the Scotch or Flag, which is larger and hardier; and the Flanders.

TIME AND MODE OF SOWING.

It is raised solely from seed, which must be sown first in the end of February, a small crop for transplanting in June and July, as well as in part to remain where sown; again for the main crop in the course of March or early in April; and lastly, towards the close of April or beginning of May, for late transplanting.

These sowings are performed in general broadcast and raked in, though some gardeners employ drills, the plants to remain after thinning; the Leek, however, is so much benefited by transplanting as obviously to point out the error of this practice.

CULTIVATION.

When the plants, are three or four inches in height, in eight or ten weeks after sowing, they must be weeded, hoed and thinned, where growing too close, to two or three inches apart; water also being given, in dry weather, will with the above treatment strengthen and forward them for transplanting in another month, or when six or eight inches high. They must be taken away regularly from the seed bed; the ground being well watered previously, if not soft, and easily yielding. When thinned out they may be left to remain in the seed bed six inches asunder as they do not grow so large as the transplanted ones, which must be set by the dibble in rows ten inches apart, and eight in the lines, being inserted nearly down to the leaves, that the neck, by being covered with the earth, may be blanched; water in abundance must be given at the time of planting, and the long weak leaves shortened, but the roots left as uninjured as possible. The bed is hoed over occasionally with advantage, as well to kill the weeds as to loosen the soil. By this treatment, and by cutting off the tops of the leaves about once a month, as new ones are produced, the neck swells to a much larger size. The several sowings above directed will yield a supply from August until the following May, when they advance to seed. A portion should be always taken up and laid in sand previous to the ground being locked up by continued frost, but they will not keep many days in this situation.

TO RAISE SEED.

To obtain seed some of the finest roots of the previous year's growth, which have been left where raised, may be transplanted from thence in February or the early part of March, eight inches asunder, in a row beneath a warm fence; and when seed stems arise they must be attached to stakes for support, or to the fencing: the closer and sooner they are drawn to this latter the better will it enable the seed to ripen, for in cold summers, particularly in open exposures, it never comes to maturity, and by the first sharp autumnal frost it is entirely destroyed. Good varieties never flower before May or June, and ripen their seed in September. The heads should be cut when changed to a brownish colour, with a foot in length of the stalk left attached, for the convenience of tying in bundles, three or four together to dry;—when they are perfectly so, they may be hung up and kept in the head until wanted, or immediately thrashed out and stored. As the husk is very tough, it is usual, when small quantities have to be operated upon, to rub them against a tile, which breaks it more easily than any other mode that can be adopted.

ALLIUM ASCALONICUM.—SHALOT OR ESCALOT.

DESCRIPTION.

Having a stronger taste than the onion, yet not leaving, as it is said, that strong odour on the palate which that species of allium is accustomed to do, it is often preferred, and employed in its stead, both in culinary preparations, and for eating in its natural state.

TIME AND MODE OF PROPAGATION.

Each offset of the root will increase if planted in a similar manner to its parent; by this means therefore it is propagated. The planting may be performed during October and November, or early in the spring, as February, March, or beginning of April. The first is the best season, especially if the soil lies dry, as the bulbs become finer; but otherwise the spring is to be preferred, for excessive moisture destroys the sets. Mr. Henderson, gardener to Sir A. Mackenzie, of Deloine, N.B. supports the practice of planting in autumn, and says "if the smallest offsets are employed for planting, they never become mouldy in the ground, and they are never injured by the most intense frosts*." They are to be planted six inches asunder each way, in beds not more than four feet wide, being usually inserted in drills, by the dibble, or with the finger and thumb, about two inches below the surface; this practice of burying them below the surface, arises from the little attention which is paid to the habits of bulbous roots, as respects the depth at which they naturally grow. Reflecting upon this, and finding that his shalots, during several years, had become mouldy and perished, the indefatigable President of the Horticultural Society was led to the practice which effectually prevents the evil, and renders them larger, better, and more abundant. The offsets are to be planted on the surface, some very rich mould being placed beneath them, and a little raised on each side to support them until they become firmly rooted, when it must be entirely removed by the hoe, and a strong current of water from the watering-pot†. The compost laid beneath the offsets, may consist of

* Mem. Caled. Hort. Soc., vol. i. p. 199.

† Trans. Hort. Soc. Lond., vol. ii. p. 97.

a mixture of well decayed hotbed dung and soot, which is very favourable to their growth, and is a preservative from the maggot*.

CULTIVATION.

The only attention they subsequently require, is to be kept clear of weeds. Some may be taken up as wanted in June, July, and August, but not entirely for storing until the leaves are withered, which takes place about the last named month; when being carefully dried and housed, they will keep until the following spring. Care must be taken that they are gradually dried in an airy situation, shaded from the meridian sun, which would cause them to wrinkle; as also to store them in dry weather.

ALLIUM SCHÆNOPRASUM.—CHIVES, OR CIVES.

TIME OF INSERTION.

It is easily propagated by offsets of the roots. The time for making plantations is January or February: however, March is the month to be preferred to either; but if previously neglected, may be performed as late as June. It is also planted in the autumn.

MODE.

They are to be inserted by the dibble, eight or ten inches apart, and eight or ten offsets in each hole. The only cultivation required is to keep them free from weeds. By autumn they multiply into large-sized bunches, and if required may be taken up as soon as the leaves decay, and be stored after the

* Mem. Caled. Hort. Soc., vol. i. p. 275.

necessary precautions, as a substitute for the onion; the leaves, which are fit for use as long as they remain green, must, when required, be cut down close to the ground, when they will speedily be succeeded by others.

ALLIUM CANADENSE—TREE OR CANADA ONION.

DESCRIPTION.

This, which is a very hardy perennial species, like the Ciboule, is without a bulbous root, but throws out numerous offsets. Its top bulbs are greatly prized for pickling, being considered of superior flavour to the common onion for that purpose, as well as others in which that species is employed.

TIME AND MODE OF PLANTING.

It is propagated both by the root offsets, which may be planted during March and April, or in September and October, and from the top bulbs, which are best planted in spring, and not before the latter end of April. The old roots are best to plant again for a crop of bulbs, as they are most certain to run to stems. If the bulbs be planted earlier than as above directed, they are apt to push up the same season and exhaust themselves without producing either good offsets or bulbs; but on the other hand, by planting the old roots in the previous autumn, or early in the spring, they will produce good bulbs the same year*. They must be inserted in rows twelve inches asunder, in holes six inches apart and two deep, a single offset or bulb being put

* Mem. Caled., Hort. Soc., vol. i. p. 350.

in each. Those planted in autumn will shoot up leaves early in the spring, and have their bulbs fit for gathering in June or the beginning of July; those inserted in the spring will make their appearance later, and will be in production at the close of July or early in August; they must not, however, be gathered for keeping or planting until the stalks decay, at which time, or in the spring also, if only of one year's growth, the roots may be taken up and parted if required for planting; but when of two or three years' continuance they must at all events be reduced in size, otherwise they grow in too large and spindling bunches; but the best plan is to make a fresh plantation annually with single offsets. The only cultivation necessary is to keep them clear of weeds; and when the stems run up to give them the support of stakes.

The bulbs, when gathered, must be gradually and carefully dried in a shady place; and if kept perfectly free from moisture, will continue in good state until the following May.

ALLIUM SCORODOPRASUM.—ROCHAMBOLE.

DESCRIPTION.

Rochambole, or as it is sometimes called Spanish Garlic, has its bulbs or cloves growing in a cluster, forming a kind of compound root. The stem bears many bulbs at its summit, which, as well as those of the root, are often preferred in cooking to garlic, being of much milder flavour.

TIME OF INSERTION.

It is best propagated by the root bulbs; those of the stem being slower in production. The planta-

tion may be made either in February, March, or early part of April, as well as throughout the autumn.

MODE.

They may be inserted either in drills or by the dibble, in rows six inches apart each way, and usually two inches within the ground, though this as well as the preceding variety would thrive better if grown on the surface, as recommended for the shalot.

CULTIVATION.

In other respects they are cultivated as directed for garlic. A very small bed is sufficient for the supply of the largest family.

ANETHUM,

From ἄνηθον, on account of its running up straight.

ANETHUM GRAVEOLENS.—DILL.

USE.

Its leaves and umbels are used in pickling, and the former in soups and sauces.

SOIL AND SITUATION.

It is a hardy plant, and if grown merely for domestic use may be cultivated in any open compartment: but if for seed, a sheltered situation, and a soil rather dry than damp, is to be allotted for it.

TIME OF SOWING.

It is propagated by seed, which is best sown immediately that it is ripe, for if kept out of the ground until the spring, it often is incapable of germinating, or if plants are produced they usually decay without perfecting their seed; if neglected until the spring, it may be sown from the close of

February until the commencement of May: the earlier, however, the better.

MODE.

It may be sown in drills a foot apart, or broadcast, very thin and raked in. The plants are to remain where sown, as they will not bear removing. When of three or four weeks' growth they must be thinned to about ten inches apart; for if not allowed room they spindle, their leaves decay, no lateral branches are thrown out, and their seed is not so good. To prevent these bad effects being caused, they in every stage of growth require to be kept clear of weeds. The leaves are fit for gathering as wanted, and the umbels about July and August. In September their seed ripens, when it must be immediately cut and spread on a cloth to dry, as it is very apt to scatter.

ANETHUM FŒNICULUM.—FENNEL.

TIME OF PROPAGATING AND MODE.

It will flourish in almost any soil or situation. In a dry soil it is longest lived. It is propagated both by offsets, partings of the root, and by seed, all of which modes may be practised, any time between the beginning of February, and the end of April. The best season, however, for sowing is Autumn, soon after the seed is ripe, at which time it may also be planted with success.

If planted, they must be set a foot apart. If sown in drills, six or twelve inches asunder, according as it is intended that the plants are to be transplanted or to remain; or else sown broadcast and raked in. When advanced to the height of four or five inches, if they are intended for removal, they are pricked out eight inches apart, to attain strength for final planting

in autumn or spring. Water must be given freely at every removal, and until established, if the weather is at all dry. They require no other cultivation than to be kept free of weeds, and the stalks of those that are not required to produce seed, to be cut down as often as they run up in summer: if this is strictly attended to the roots will last for many years; but those which are allowed to ripen their seed, seldom endure for more than five or six.

ANETHUM AZORICUM.—FINOCHIO, OR AZORIAN FENNEL.

It is not in much esteem here, its peculiar flavour being agreeable to few palates. It is served with a dressing like salads.

SOIL AND SITUATION.

For the first crop, a rich light soil must be selected; for the succeeding sowings a more retentive one, but for the two last a return must be had to a drier and warmer situation. These precautions are absolutely necessary, for in either extreme of moisture or dryness the plants will not thrive. A small bed will be only required at each sowing: one twenty feet by four is sufficient for the largest family.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown for successional crops, from the beginning of March until the close of July, at intervals of a month, for after attaining its full growth it immediately advances for seed. The seed is sown in drills two feet asunder, to remain, scattered thinly, that is, about two inches apart, and about half an inch below the surface. When well come up, about three or four weeks after

sowing, they must be small-hoed, to kill the weeds, from which they should be kept completely clear throughout their growth, but at that time only thin to three or four inches asunder, as it cannot thus early be determined which will be the most vigorous plants. After the lapse of another month they may be finally thinned to seven or eight inches' distance from each other. Moderate waterings are required throughout their growth, during dry weather: and in the meridian of hot days the beds are advantageously shaded, until after the plants are well up. When of advanced growth, about ten weeks after coming up, the stems must be earthed up to the height of five or six inches, to blanch for use, which will be effected in ten or fourteen days. In the whole about twelve or fourteen weeks elapse between the time of sowing, and their being fit for use. In autumn, if frosty mornings occur, they should have the protection of some litter or other light covering.

TO OBTAIN SEED.

The seed coming from Italy is generally worthless; and in this country it is saved with difficulty, the plants of the last sowings, if left, being killed by the winter, and if some of the earliest are allowed to remain, they never ripen until late in the year, and are often killed by early severe frosts. It would be a good practice, perhaps, to sow a little seed under a frame early in February: this would greatly forward them.

ANGELICA ARCHANGELICA.—ANGELICA.

USE.

It was formerly blanched and eaten like Celery; but at present, its tender stalks are the only part made use of, which are cut in May for candying.

SOIL AND SITUATION.

It may be grown in any soil and exposure, but flourishes best in moist situations, consequently the banks of ponds, ditches, &c. are usually allotted to it.

TIME OF SOWING.

It is propagated by seed, which is to be sown soon after it is ripe, about September, being almost useless if preserved until the spring, as at that season not one in forty will be found to have preserved its vegetative powers; if, however, it be neglected until that season, the earlier it is inserted the better.

MODE OF CULTIVATION.

It may be sown either broadcast moderately thin, or in drills a foot asunder, and half an inch deep. When arrived at a height of five or six inches they must be thinned, and those removed transplanted, to a distance of at least two feet and a half from each other, either in a bed, or on the sides of ditches, &c., as the leaves extend very wide. Water in abundance must be given at the time of removal, as well as until they are established; but it is better to discontinue it during their further growth, unless the application is regular and frequent. In the May, or early June of the second year, they flower, when they must be cut down, which causes them to sprout again, and if this is carefully attended to they will continue for three or four years, but if permitted to run to seed they perish soon after.

SEED.

A little seed should be saved annually, as a resource in case of any accidental destruction of the crop.

ANTHEMIS.

From ἀνθέω on account of its abundance of flowers, or luxuriance of growth.

ANTHEMIS NOBILIS—CHAMOMILE.

VARIETIES.

There are two varieties, the common single and the double flowering.

SOIL AND SITUATION.

They require a poor dry soil, otherwise they grow very luxuriant, and become not only less capable of withstanding severe winters, but also less powerful in their medicinal qualities. They will grow in any situation almost, but the more open the better.

TIME AND MODE OF PROPAGATION.

It is generally propagated by parting the roots, and by offsets, which may be planted from the close of February until the end of May, the earlier, however, it is performed the better; this is the most favourable season, but it may be practised in the Autumn. It is also raised from seed, the proper time of sowing which is in any of the early spring months, but as the former mode is so easily practised and with much less trouble, it is generally pursued; though it is advisable after a lapse of several years to raise fresh plants, the old ones often declining in production after such lapse of time.

CULTIVATION.

Being shrubby with extending lateral branches, they should not be planted nearer to each other than

eighteen inches; as that also gives an opportunity to employ the hoe. Water must be given moderately at the time of planting, if dry weather, otherwise it is not at all required. If raised from seed they require no further cultivation than to be kept free of weeds in the seed-bed; and when three or four inches high, to be thinned to about six inches apart; and may remain thus until the following spring then to be thinned and remain, or to be removed to the above mentioned distance apart. A very small bed will supply the largest family.

GATHERING.

In July the flowers are generally in perfection for gathering; the period for performing it, however, must be governed by the flowers themselves, as the best time is when they are just opened. Particular care must be taken to dry them thoroughly before they are stored; otherwise they will not keep. If seed is required the only attention necessary is to leave some of the first opening flowers ungathered; the seed will ripen early in September, when it may be cut, dried, and rubbed out.

APIUM.

Probably from "apex," *a tuft, or crest, which its umbels form.*

SOIL AND SITUATION.

They flourish most in a moist soil, friable, and rather inclining to lightness; it must be rich, and that rather from prior application, than the immediate addition of manure; celery, and celeriac, however,

appear benefited even by its abundant application at the time of sowing and planting. The parsleys, likewise, prefer their soil to incline rather to dryness. For all it must be deep, and all equally refuse to thrive on a strong clayey soil. The situation they thrive the most in, is one that is as open as possible, and as free from the influence of trees. The common parsley is the one that bears best a confined or shady compartment.

APIUM DULCE—CELERY.

VARIETIES.

THERE are six varieties of this esculent in general cultivation.—The gigantic, the dwarf-curled, the common upright, red-stalked upright, giant hollow upright, and the solid-stalked (red and white). The red chiefly for soups, the white being much more delicate in flavour.

TIME OF SOWING.

It is propagated by seed; the first sowing to be performed both in a hotbed, and on a warm, light border, towards the end of February, some gardeners even insert it as early as the middle of January. The border is by many gardeners considered the best situation, in as much that the plants are more hardy, and with proper care come forward with scarcely any difference as to time: this is to be repeated in March; but the principal sowings must take place in April and May; and the last one in June. As the produce of the early sowings will not continue long in a state fit for use, from their leaf-stalks becoming

piped, or hollow, they must be proportionably small: they must all be inserted broadcast, and the seed scattered thinly. The seed-beds of the early sowings should be light and dry, with the full enjoyment of the sun throughout the day, but for the three last, in a moist situation; and it is advantageous for them to have a free exposure to the morning sun only, yet free from the drip of trees; so advantageous is it to have the plants of these sowings as luxuriant as possible in their first stage of growth, that to afford them as regular and unstinted a supply of nourishment as possible, the mould of the seed bed is often formed artificially. Mr. Walker, Gardener to J. Walker, Esq. of Longford, N. B. recommends it to be formed of black, loamy soil, and old hotbed dung in equal parts*. The plants from these several sowings will in general be ready for pricking out in four or six weeks from the time of insertion, and for final planting, after a further continued growth of two months. A more determinate datum for judging the appropiate time for performing these operations, is the size of the plants, they being fit for the first removal when three or four inches in height, and for the second when seven or eight. From the above enumerated sowings, monthly plantations may be successionally made from the commencement of June, until September closes; but for the supply of a family, a sowing at the close of February for production during the same year, and another about the middle of May, to yield a produce in the winter, and following spring, will in general be amply sufficient.

PRICKING OUT.

When pricked out, they must be set about six inches asunder each way in rows. In thinning the

* Mem. Caled. Hort. Soc., vol. ii. p. 295.

seed-beds, the largest should be first extracted, and the smaller ones left to attain an increase of growth; by carefully attending to this, the same bed will afford three different prickings, each succeeding the other in becoming fit for final removal and use. Both the seed beds, and those pricked, must be kept regularly watered and weeded, to encourage the small plants in the first to advance; and those of the latter to take root and flourish. Those of the first crop in the hotbed must be removed like the others into a border, allowing them the preference of one that is warm and sheltered, and in cold seasons, sheltered at night with matting. The soil into which they are pricked, should in every instance be moist and rich. Mr. Walker, before mentioned, forms the bed for the reception of the seedlings, entirely of old hotbed dung, breaking it very fine, and laying it six or seven inches thick, founding this on a piece of ground beaten hard, or which has not been disturbed for some time; this prevents a tap root being formed, and consequently promotes the increase of the fibrous ones, prevents their running untimely to seed, and is advantageous in collecting the scanty moisture of summer*.

FINAL PLANTING.

They are usually planted out finally in trenches, from twelve to eighteen inches wide, and at least four feet apart. To cut the trench straight, and with firm sides, the spade should be thrust down all along the line which marks the boundary on each side, previous to digging out the earth: the top spit of mould throughout the length must be turned alternately on either side, for this is required in the after cultivation for earthing up the plants. Some

* Mem. Caled. Hort. Soc., vol. ii. p. 296.

well putrefied dung two or three inches thick, must be then spread along the bottom and dug in, care being taken that its surface is not more than four inches below the regular surface of the soil. Mr. Walker here recommends the same unsparing application of manure, he forms the soil in his trenches of three parts dung, and one part fresh strong soil*

Celery, as before mentioned, delights in a soil abounding in fertilising matter; the mode adopted to effect this, as practised by Mr. Judd, Gardener to C. Campbell Esq. of Edmonton, is one which with equal advantage may be adopted for any crop requiring a very rich soil; he prepares his ground in the winter preceding the time of planting, or as long before as convenient, by manuring and trenching it two spades deep; performing this last operation twice, that the dung may be better incorporated with the soil, and then leaves it as rough as possible, until the time arrives for forming the trenches, at the bottom of which he also turns in some manure †. As Celery is very apt to decay in winter on account of excessive moisture, it would undoubtedly be a good practice, after preparing the ground as just detailed, to plant in rows, five or six feet apart on the surface, taking the mould required for earthing them up, from this allotted space.

Before planting, the long straggling leaves are to be cut away, and any side offsets removed; but if

* Mem. Caled. Hort. Soc., vol. ii. p. 296. By this abundant application of manure, his Celery undoubtedly obtains a fine growth, being often four and a half feet long, and averaging six pounds weight: but at the same time it is to be remarked, that many soils will grow it equally fine, without such immoderate application.

† Trans. Hort. Soc. Lond., vol. iii. p. 46.

the plants are older or larger in growth than before mentioned, the tops of the leaves may be generally removed, which serves to check their running to seed, which they are otherwise apt to do. After this preparation they may be planted a single row in each trench, about eight inches apart; Mr. Judd says that he finds the plants are much injured in their future growth, if during any of their removals their roots become at all dry; therefore when taking them either from the seed bed, or for final planting, he lays them as he draws them from the ground, in a garden pan containing a little water*. Planting is best performed of an evening, and water given plenteously at the time, as well as every other day subsequently until they are well established.

EARTHING UP.

Earthing them up must commence when they are about a foot high, and may be continued until the plants are fit for use, or are one foot and a half high, and upwards. In performing it one person must hold the bases of the plants together, whilst a second regularly follows, and throws in the soil, otherwise the mould separating the leaves, breaks them and induces decay, and ofttimes destroys them by injuring the heart. If a second person is not at hand, the plan of Mr. Judd may be adopted with advantage, he employs a line formed of bass matting or other material of sufficient length, one end of which he fastens round the first plant in the row, and passing on gives it one twist round each of the others, until the other end is reached and again fastened. This ligature is easily removed when the moulding is

* Trans. Hort. Soc. Lond., vol. iii. p. 45.

completed, by beginning to untwist it at the end last fastened*.

The earthing is best performed gradually, a few inches being added once a week, and a dry day always selected to perform it in.

TAKING UP.

In taking up for use, which they will be fit for in six or seven months from the time of sowing, the row should always be commenced at one end, and the earth being dug away entirely down to the root, the plants may be easily extracted, if attempted to be idly forced up they generally break.

ADDITIONAL PRECAUTIONS.

In very severe weather the winter standing crops should be covered with straw or other litter, care being taken always to remove it in mild days. On the arrival of frost a quantity may be taken up, and buried in sand under shelter. As celery will not continue in perfection except in winter, more than three or four weeks after bleaching, it is advisable for family use only to make small plantations, of the early crops at a time. Throughout their various stages of growth, the plants must be kept free from weeds, and in autumn from the fallen leaves, both of which weaken and cause decay.

TO SAVE SEED.

To raise seed some plants must be left where grown; or in February or March, some may be carefully taken up, and after the outside leaves are cut off, and all laterals removed, planted in a moist soil, a foot apart. Those which are most solid and of a middling size are to be selected. When they branch

* Trans. Hort. Soc. Lond., vol. iii. p. 47.

for seed they must be each attached to a stake, to preserve them from being broken by the violence of winds. The flower appears in June, and when the seed is swelling in July, if dry weather occurs, they should be watered every other night. In August the seed will be ripe, and when perfectly dry may be rubbed out and stored.

APIUM RAPACEUM.—CELERIAC.

TIME AND MODE OF SOWING.

It is propagated by seed which may be sown in March, April, and May, to afford successional plantations in June, July, and August. The seed must be sown broadcast, and kept regularly watered every evening in dry weather, otherwise it will not germinate. The bed must be kept free of weeds, and when about three inches high they may be pricked out into another border, in rows three inches apart each way, giving water abundantly and frequently; by adopting the precautions mentioned in the cultivation of celery, the same seed bed will afford two or three distinct prickings. Earl Stanhope says that in the neighbourhood of Dresden, where this vegetable is grown in great perfection, they sow in February or March in a hot-bed under glass, and the plants are removed in April, when two or three inches high, to another hotbed, and set an inch and a half apart*. The fineness of the plants is there attributed to the abundance of water with which they are supplied, but as this

* Trans. Hort. Soc. Lond., vol. iii. p. 72.

copious supply of moisture is inculcated in all our works on gardening, and is duly appreciated by those with whom I have conversed, it must rather arise from their being raised earlier, and consequently their growth proceeding during a more genial season.

FINAL PLANTING.

When five or six inches high they are fit for final planting; they must be set in rows two feet asunder, and the plants eight inches apart; on the level ground, or in drills drawn with the hoe at most three inches deep, as they require but little earthing up. When arrived to nearly its full size, it must be covered over with the earth to the depth of about three inches. In dry weather they should be watered plentifully at least every other evening. The only additional attention they require is to keep them free from weeds.

SAVING SEED.

The directions given for the saving the seed of celery is in every respect applicable to this vegetable.

APIUM PETROSILINUM.—PARSLEY.

VARIETIES.

There are two varieties, the common plain-leaved, and the curly-leaved. It is somewhat singular that the first should be most cultivated, notwithstanding the superior beauty of the latter, as well as by reason of its curled leaves rendering it more easily to be distinguished from the Æthusa or Fool's parsley, a variety of the Hemlock often occurring in gardens; it requires much care in saving the seed otherwise it degenerates into the plain-leaved.

TIME AND MODE OF SOWING.

It is raised from seed, which is recommended usually to be sown annually, but if it is never permitted to run to seed, the stalks being cut down as often as they rise, it will last for several years. It may be sown from the close of February until the middle of June, and this is repeated about the middle of September, for the supply of Winter and Spring, but this is unnecessary if the plants are not allowed to seed. The seed is to be inserted moderately thick, in narrow drills barely an inch deep, twelve inches apart if in a bed by itself, or in a single one round the edge of a bed; the mould being raked level, and the stones immediately over them gathered off. The plants will not make their appearance in less than three or four, and sometimes six weeks. When two or three inches high it may be gathered from as required. In early June when the plants make a show for seed, the stems should be cut down close to the bottom, and again in September if it has acquired a straggling rank growth, this will cause it to shoot afresh, and acquire a strong growth before the arrival of severe weather. On the approach of frost if protection is afforded to the plants by means of haulm or reed pannels, so supported as not to touch them, it will preserve them in much better state for use in Winter and Spring.

TO OBTAIN SEED.

To save seed nothing more is necessary than to allow some of the plants to run up in June, they should not, however, be allowed to stand nearer than eighteen inches to each other. The seed ripens in early autumn, and when perfectly dry may be beaten out, and stored.

APIUM LATIFOLIUM—HAMBURGH PARSLEY.

USE.

This esculent, is likewise known by the name *broad-leaved* and *large rooted-parsley*. It is cultivated for its root which attains the size of a middling parsnep, boiling exceedingly tender and palatable. It is eaten both as a sauce to flesh meat, and in soups, &c.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown at monthly intervals from February until the middle of June. It is sown either thinly in drills nine inches apart, or broadcast and raked in. The plants appear in about a month after sowing, and when of tolerable growth require to be thinned to nine inches asunder, and cleared from weeds either by hand or the hoe; which latter operation being performed as often as weeds appear is the only cultivation required. By the end of July or during August, the earliest sowings will have acquired a sufficient size for occasional use; but they seldom attain their full growth until Michaelmas; and the latest crops not until the following year. On the arrival of frost some of them must be taken up, and after the removal of the superfluous fibres, decayed leaves, &c. buried in sand in a dry situation under cover.

TO SAVE SEED.

To obtain seed some plants must be left where grown, and allowed to run in May, their produce

will ripen in July or August, when it must be cut and when perfectly dry, beat out and stored.

ARTEMISIA.

So named in honour of Artemisia, wife of King Mausolus, or of Diana Αρτεμις.

WORMWOODS.

DESCRIPTION.

There are four perennial rooted litter aromatics included under this name, and cultivated solely for medicinal purposes. Common Wormwood, (*Artemisia absinthium*), is a native of almost every part of Europe, and in this country is found by road-sides on heaps of rubbish, &c. The same remarks apply to the sea-wormwood (*A. maritima*), which is found on salt marshes and the sea coast. Roman wormwood (*A. Pontica*) is a native of Italy, and Santonicum or Tartarian wormwood, (*A. Santonica*), of Persia and Siberia.

SOIL AND SITUATION.

The soil best suited to them, is one that is dry, light and poor, otherwise they grow luxuriantly, and are defective in their medicinal qualities, as well as in their power to withstand the rigour of the winter. Any situation will suit the common and sea wormwoods that is open and unconfined, but the exotic species require to be sheltered from the severe aspects. In a severe winter the Tartarian can only be preserved under a frame. The sea wormwood seldom flourishes from the want of a genial soil; the application of salt would undoubtedly be beneficial.

TIME AND MODE OF PROPAGATING.

They are all propagated by seed, as well as slips and cuttings the first of which may be sown in March or April; and the latter planted during June, July and beginning of August. The seed is sown thinly broadcast, and when the plants arrive at a height of two or three inches, are weeded and thinned to six inches asunder; and those taken away pricked out at a similar distance; water being given if the weather is at all dry. The slips and cuttings are planted in a shady border, about eight inches apart, and water given regularly every evening until they have taken root. They are all to be transplanted finally early in the following spring, by whichever mode they are raised, setting the plants at last eighteen inches apart. The only cultivation required is to clear away the decayed stalks in autumn, and to keep them constantly clear of weeds by frequent hoeings. To obtain seed no further care is required than to gather the stems as they ripen in autumn. The Roman seldom perfects its seed. The common flowers from July to September. The sea-wormwood in August. The Roman from August to September. The Tartarian from September to October; and from six to eight weeks elapse from their flowering to the time of the seed being ripe.

ARTEMISIA DRACUNCULUS—TARRAGON.

USE.

It is used in salads to correct the coldness of the other herbs; and its leaves are likewise excellent when pickled.

SOIL AND SITUATION.

It will flourish in any soil or situation that is poor and bleak. Indeed a poor, dry earth is essential to produce it in perfection as to flavour, and hardy so as to endure the severity of winter.

TIME AND MODE OF PROPAGATING.

It is propagated by parting the roots, slips and cuttings; as also by seed to be sown in the spring, but as this mode is attended with much more trouble it is never practised.

To have green Tarragon during the winter and early spring, strong-rooted plants must be planted, small portions at a time, once or twice a month from the close of October to the end of January. For the main crop it may be planted any time from the end of February until the conclusion of May; and by cuttings of the young stalks from the close of June until the same period of August; this last mode is, however, not so often adopted on account of the uncertainty attending the rooting of the cuttings.

CULTIVATION.

Whenever the plants are inserted they must be set at least ten inches apart; and if dry weather, especially in the summer months, water must be given regularly every evening until they are rooted. They soon establish themselves and may be gathered from the same year. As they run up, if seed is not required, the stem should be cut down, which causes them to shoot afresh. The only additional cultivation required is to keep them free from weeds. At the end of autumn if some established plants are set beneath a south fence, they will often afford leaves throughout the winter, or at all events come

early in the spring. Some of the leaves should be gathered in the summer, and dried for winter's use.

To obtain seed, it is only necessary to allow it to run up without molestation. It flowers about July, and when the seed is ripe in early autumn, must be cut, and completely dried, before it is beaten out.

WORMWOODS.

These species of the artemesia are so little cultivated, that they require no further notice.

ASPARAGUS.

From the Greek ασπαραγος, *a young shoot before it expands.*

VARIETIES.

There are only two varieties, the red-topped and the green-topped; the first is principally cultivated. There are a few sub-varieties which derive their names from the places of their growth, and are only to be distinguished for superior size or flavour, which they usually lose on removal from their native place.

SOIL.

The soil best suited to this vegetable, is a black, fresh, sandy loam, made rich by the abundant addition of manure; it should be neither tenacious from the too great preponderance of clay, nor too dry from a superabundance of silica, but should be retentive of moisture chiefly by reason of its richness. To raise fine roots for hot beds, they may be raised in a much moister soil*, but for natural production this

* Miller's Dictionary.

will not answer, as such plants are much shorter lived.

SITUATION.

The site of the beds should be such as to enjoy the influence of the sun during the whole of the day, as free as possible from the influence of trees and shrubs, and, if choice is allowed, ranging north and south. The subsoil should be dry, or the bed kept so, by being founded on rubbish or other material to serve as a drain. The space of ground required to be planted with this vegetable for the supply of a small family is at least eight rods, if less it will be incapable of affording one hundred heads at a time (Marshall says six rods will afford this quantity), so that part must be kept two or three days after it is cut, especially in ungenial seasons, to allow time for the growth of more to make a sufficient number for a dish. Sixteen rods will, in general, afford two or three hundred every day in the height of the season †.

TIME OF SOWING.

To raise plants the seed may be sown from the middle of February to the beginning of April; the most usual time is about the middle of March. The best mode is to insert them by the dibble, five or six inches apart and an inch below the surface, two seeds to be put in each hole; or they may be sown in drills made the same distance asunder, or broadcast.

CULTURE IN SEED BED.

If dry weather, the bed should be refreshed with moderate but frequent waterings, and if sown as late as April, shade is required by means of a little haulm during the meridian of hot days, until the seeds germinate. Care must be taken to keep them free

† Miller's Dictionary.

from weeds, though this operation should never commence until the plants are well above ground, which will be in the course of three or four weeks from the time of sowing. If two plants have arisen from the same hole, the weakest must be removed as soon as that point can be well determined. Towards the end of October, as soon as the stems are completely withered, they must be cut down, and well putrefied dung spread over it to the depth of about two inches: this serves not only to increase the vigour of the plants in the following year, but to preserve them during the winter from injury by the frost. About March in the next year, every other plant must be taken up, and transplanted into a bed, twelve inches apart, if it is intended that they should attain another, or two years' further growth, before being finally planted out; or they may be planted immediately into the beds for production. It may be here remarked, that the plants may remain one or two years in the seed-bed; they will even succeed after remaining three, but if they continue four they generally fail: it is, however, nearly certain that they are best removed when one year old, for the earlier a plant can possibly be removed, the more easily does it accommodate itself to the change, and less injury is it apt to receive in the removal. Some gardeners sow the seed in the beds where they are to remain for production. This mode too has the sanction of Miller. The seed is inserted in the bed prepared, as will next be described. In the early stage of their growth, the plants must be treated as when in the seed-bed, and subsequently as will hereafter be directed.

TIME OF FINAL PLANTING.

The time for the final removal is from the middle of February until the end of March, if the soil is dry

and the season warm and forward; otherwise it is better to wait until the commencement of April. The plan which some persons have recommended, to plant in autumn, is so erroneous, that, as Miller emphatically says, the plants had better be thrown away. Mr. D. Judd has mentioned a very determinate signal of the appropriate time for planting, which is, when the plants are beginning to grow: if moved earlier, and they have to lie torpid for two or three months, many of them die, or in general shoot up very weak*.

Immediately that the buds begin to swell they should be removed, and this may easily be ascertained by occasionally opening the ground down to the stool. A successful experiment, tried by Mr. J. Smith, gardener to the Earl of Kintore, would evince that one year old asparagus plants may be removed even as late as June. The stems of his plants, at the time of removal in that month, were twelve or fifteen inches high; they were removed and treated with the greatest care, the earth being gently pressed round the root, and water given plentifully; but although the experiment perfectly succeeded, none of them died, and although they surpassed in growth those left in the seed-bed—so much so, as that they might have been cut from—yet still, for many reasons, we are justified in considering that this must have been tried under accidental or very favourable circumstances of soil and season, and it requires repeated experiments from different counties, before the practice is confirmed †.

CONSTRUCTION OF THE BEDS.

In forming the beds for regular production, it is customary to have them four or five feet wide. In

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* Trans. Hort. Soc. Lond., vol. ii. p. 236.

† Caled. Hort. Mem., vol. i. p. 71.

the first instance, they have three rows of plants, in the latter four. The site of the bed being marked out, the usual practice is to trench the ground two spades deep, and then to cover it with well rotted manure from six to ten inches deep; the large stones being sorted out and care taken that the dung lies at least six inches below the surface. To mix the manure with the soil effectually, Mr. D. Judd, before mentioned, trenches his ground two feet deep, three times successively during the autumn or winter, at intervals of a fortnight, and then lays it in ridges until wanted, performing the work in the absence of rain or snow; he justly observes, that the preparation of the soil is of more consequence to be attended to, than all the after management*. In France, however, where the beds are celebrated for the number of years they continue in production, a pit is dug five feet in depth, and the mould that is taken from it sifted, care being taken to reject all stones, even as small as a filbert; the best part of the mould is laid aside for making up the bed. The bed is then formed as follows, beginning at the bottom; six inches deep of common manure—eight of turf, very free from stones—six of manure—six of sifted earth—eight of turf—six of very rotten dung—eight of best earth; finally this last layer of mould is well incorporated with adjoining one of dung. The bed is then ready for the reception of the plants†.

MODE OF PLANTING.

The plants being taken from the seed-bed carefully with a narrow pronged dung-fork, with as little injury to the roots as possible, they must be laid separate and even together, for the sake of

* Trans. Hort. Soc. Lond., vol. ii. p. 234.
† Dr. Macculloch, in the Caled. Hort. Mem.

convenience whilst planting, the roots being apt to entangle, and cause much trouble and injury in parting them. They should be exposed as short a time as possible to the air; and to this end it is advisable to keep them until planted in a basket, with a little sand, and covered with a piece of mat. The mode of planting is to form drills or narrow trenches five or six inches deep and a foot apart, cut out with the spade, the line side of each drill being made perpendicular, and against this the plants are to be placed, with their crowns one and a half or two inches below the surface, and twelve inches asunder: in France eighteen are allowed. The roots must be spread out wide in the form of a fan, a little earth being drawn over each to retain it in its position whilst the row is proceeded with. If the plants have begun to shoot, it is the practice in France to remove the sprouts, and with this precaution the planting is successfully performed as late as July, and if any of those die which were first planted they are replaced at that season *. This is a practice to be avoided as much as possible, for it obviously must weaken the plants, and be particularly detrimental to such young plants. For the sake of convenience, one drill should be made at a time, and the plants inserted and covered completely, before another is commenced; the two outside drills must be each six inches from the side of the bed. When the planting is completed the bed is to be lightly raked over, and its outline distinctly marked out. Care must be had never to tread on the beds—they are formed narrow to render it unnecessary—for everything tending to consolidate them is injurious, as, from the length of time they have to continue without a possibility of stirring them to any con-

* Dr. Macculloch, Caled. Hort. Mem.

siderable depth, they have a natural tendency to have a closer texture than is beneficial to vegetation. Water must be given occasionally in dry weather until the plants are established. The paths between the beds are to be two and a half feet wide.

SUBSEQUENT CULTIVATION.

Throughout the year, care must be taken to keep the beds clear of weeds. In the latter end of October or commencement of November the beds are to have their winter dressing: the stalks must be cut down and cleared away, and the weeds hoed off into the paths, care being taken not to commence whilst the stems are at all green, for if they are cut down whilst in a vegetating state, the roots are very prone to shoot again, and consequently are proportionably weakened *. It is generally recommended not to add any manure until the bed has been two or three years in production, and then only to apply it every other year; but I consider it much more rational to manure regularly every year from the time of forming the bed, though in less quantity than if done every other year. I put on about two inches depth of well decayed hotbed. By this means a continued and regular supply of decomposing matter is kept up, which is not so perfectly effected by the usual mode; and from the experiments purposely instituted by Miller we learn, that on the richness of the ground and warmth of

* This habit might perhaps be taken advantage of in assisting our forcing this esculent; cutting down the summer produced stems of such stools as are intended for the hotbed, a considerable time before they lose their verdant colour, would give them a natural tendency to shoot again, and consequently assist the effect of the artificial heat employed.

the season, the sweetness of asparagus depends, in proportion to the poverty of the soil they acquire a strong flavour. The dung needs merely to be laid regularly over the bed, and the weeds, as well as some manure, to be slightly pointed into the paths, some of the mould from which must be spread to the depth of two inches over the dung just laid upon the beds. In France they cover the beds at this season with six inches depth of manure and four of sea-sand if procurable, otherwise of river-sand or fine earth. No forking is required at this season; but the boundaries of the bed must be marked out distinctly, as they should be kept indeed at all times. In the end of March or early in April, before the plants begin to sprout, the rows are to be stirred between to a moderate depth with the asparagus fork, running it slantingly two or three inches beneath the surface, as the object is merely to stir the surface and slightly mix it with the dung. Great care must be taken not in the least to disturb the plants. Some gardeners recommend the beds should only be hoed again, so fearful are they of the injury which may be done to the stools; but if it be done carefully as above directed, the fork is the best implement to be employed, as by more effectually loosening the soil, it is by far the most beneficial in its effects upon the plants. This course of cultivation is to be continued annually, but with this judicious modification, that earth be never taken from the paths after the first year, but these merely be covered with dung, and which is only to be slightly dug in, for every gardener must have observed, that the roots of the outer row extend into the alleys, and are consequently destroyed if they are dug over; and rather than that should take place, the beds should have no winter covering, unless mould can be obtained from some other source, as

asparagus does not generally suffer from frost, as is commonly supposed *.

TIME OF PRODUCTION.

In May the beds are in full production of young shoots, which when from two to five inches high are fit for cutting, and as long as the head continues compact and firm. Care must be taken, in cutting, not to injure those buds, which are generally rising from the same root, in various grades of successional growth within the ground. The knife ought to be narrow pointed, the blade about nine inches in length, and saw edged: the earth being carefully opened round the shoot, to observe whether any others are arising, the blade is to be gently slipped along the stalk until it reaches its extremity, where the cut is to be made in a slanting direction. It almost always occurs, that the same stool produces a greater number of small heads than large ones, but the latter only should be cut; for the oftener the former are removed, the more numerously will they be reproduced, and the stools will sooner become exhausted.

TO OBTAIN SEED.

Great attention must be paid to the seed. For the obtaining it some shoots should be marked and left in early spring, for those which are allowed to run up after the season of cutting is over, are seldom forward enough to ripen their seeds perfectly. In choosing the shoots for this purpose, those only must be marked which are the finest, roundest, and have the closest heads; those having quick opening heads or are small or flat, are never to be left. More are to be selected than would be necessary if each stem

* Trans. Hort. Soc. Lond., vol. ii. p. 236.

would assuredly be fruitful, but as some of them only bear male or unproductive blossoms, that contingency must be allowed for.. Each chosen shoot must be fastened to a stake, which, by keeping it in its natural position, enables the seed to ripen more perfectly. The seed is usually ripe in September, when it must be collected, and left in a tub for four or six weeks, for the pulp and husk of the berry to to decay, when it may be well cleansed in water. The seeds sink to the bottom, and the refuse floats and will pass away with the water as it is gently poured off. By two or three washings the seeds will be completely cleansed; and when perfectly dried by exposure to the sun and air, may be stored for use. Some gardeners keep them in the pulp until the time of sowing, unless required to be sent to a distance*.

TO FORCE ASPARAGUS.

PLANTS TO BE EMPLOYED.

Such plants must be inserted in hotbeds as are five or six years old, and appear of sufficient strength to produce vigorous shoots: when, however, any old natural ground plantations are intended to be broken up at the proper season, some of the best plants may be selected to be plunged in a hotbed or any spare corner of the stove barkbeds. When more than ten years old, they are scarcely worth employing. To plant old stools for the *main* forcing crop, is, however, decidedly erroneous, for, as Mr. Sabine remarks, if plants are past production, and unfit to remain in the garden, little can be expected from them when forced.

* Trans. Hort. Soc. Lond., vol. ii. p. 234.

TIME OF PLANTING.

The first plantation for forcing should be made about the latter end of September; the bed, if it works favourably, will begin to produce in the course of four or five weeks, and will continue to do so for about three; each light producing in that time 300 or 400 shoots, and affording a gathering every two or three days.

QUANTITY OF PRODUCE.

To have a regular succession, therefore, a fresh bed must be formed every three or four weeks, the last crop to be planted in March or the early part of April; this will continue in production until the arrival of the natural ground crops. The last made beds will be in production a fortnight sooner than those made about Christmas.

BED.

The bed must be substantial, and proportioned to the size and number of the lights, and to the time of year—being constructed of stable dung, or other material, as directed p. 8. The common mode of making a hotbed is usually followed, but, as Mr. Sabine remarks, the general appearance of forced asparagus in December and the two following months, gives a sufficient indication of defective management. The usual mode he considers erroneous, inasmuch as that the roots of the plants come in contact with, or are over a mass of fermenting matter; and the mode of raising potatoes practised by Mr. Hogg, which will be hereafter stated, first suggested the plan for obviating this defect, and it has been confirmed as correct by the successful practice of Mr. Ross, gardener to E. Ellice, Esq., of

Brentford, who, by planting his asparagus in the tan of his exhausted pine pits, which consist of eighteen inches leaves, and over that the same depth of tan, and applying hot dung, successively renewed, round the sides, and thus keeping up a good heat, produced in five weeks asparagus so fine, and by admitting as much air as possible during the day, of such good colour and so strong, as nearly to equal the natural ground crops. It is the best practice to plant the asparagus in mould laid upon the tan, which, or some other porous matter, is indispensable for the easy admission of the heat from the linings.* The bed must be topped with six or eight inches of light rich earth.

QUANTITY NECESSARY.

If a small family is to be supplied, three or four lights will be sufficient at a time; for a larger six or eight will not be too many. Several hundred plants may be inserted under each, as they may be crowded as close as possible together; from 500 to 900 are capable of being inserted under a three-light frame, according to their size.

MODE OF PLANTING.

In planting, a furrow being drawn the whole length of the frame, against one side of it the first row or course is to be placed, the crowns upright, and a little earth drawn on to the lower ends of the roots; then more plants again in the same manner, and so continued throughout, it being carefully observed to keep them all regularly about an inch below the surface: all round on the edge of the bed, some moist earth must be banked close to the outside roots.

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* Trans. Hort. Soc. Lond., vol. ii. p. 361—3.

PRECAUTIONS NECESSARY.

If the bed is extensive it will probably acquire a violent heat: the frames must therefore be continued off until it has become regular, otherwise the roots are liable to be destroyed by being, as it is technically termed, *scorched* or *steam-scalded.*

TREATMENT.

When the heat has become regular the frames may be set on, and more earth be applied by degrees over the crowns of the plants, until it acquires a total depth of five or six inches. The glasses must be kept open an inch or two, as long and as often as possible, without too great a reduction of temperature occurring, so as to admit air freely and give vent to the vapours, for on this depends the superiority in flavour and appearance of the shoots. The heat must be kept up by linings of hot dung, and by covering the glasses every night with mats, &c.

TEMPERATURE NECESSARY.

The temperature at night should never be below 50°, and in the day its maximum at 62°.

GATHERING.

In gathering, for which the shoots are fit when from two to five inches in height, the finger and thumb must be thrust down into the earth, and the stem broken off at the bottom.

ATRIPLEX.

So named, ab atro colore, *from a supposed livid hue that it imparts to those who eat of it.*

ATRIPLEX HORTENSIS.—ORACH.

DESCRIPTION.

It is cooked and eaten in the same manner as spinach, to which it is much preferred by many persons, although it belongs to a tribe whose wholesomeness is very suspicious.

SOIL AND SITUATION.

It flourishes best in a rich moist soil, and in an open compartment. Those, however, of the autumn sowing, require a rather drier soil.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown about the end of September, soon after it is ripe, and again in the spring for succession. The sowing to be performed broadcast, the seeds being scattered thin. The plants soon make their appearance, being of quick growth. When they are about an inch high, they must be thinned to four inches asunder; and those removed may be planted out at the same distance in a similar situation, and watered occasionally until established. At the time of thinning, the bed must be thoroughly cleared of weeds, and if they are again hoed during a dry day, when the plants are about four inches high, they will require no further attendance than an occasional weeding by hand.

For early production, a sowing may be performed in a moderate hotbed, at the same times as those in the natural ground.

The leaves must be gathered for use whilst young, otherwise they become stringy and worthless.

TO SAVE SEED.

To obtain seed, some plants of the spring sowing must be left ungathered from, and thinned to, about eight inches apart. The seeds ripen about the end of August, when the plants may be pulled up, and when perfectly dry rubbed out for use.

BETA.

So named from the Greek character beta, *which its seeds resemble when they begin to swell.*

BETA VULGARIS—BEET-ROOT.

DESCRIPTION.

Of this biennial vegetable there are three species and numerous varieties, one having red and the other yellow roots.

VARIETIES.

We have now nine varieties of this esculent, which are described with considerable descrimination by Mr. Morgan, gardener to H. Browne, Esq., Mimms Place, Herts, in the Transactions of the Horticultural Society.

BETA CICLA—WHITE BEET.

DESCRIPTION.

This is also known as the Chard, or Carde.

VARIETIES.

We have two species in common cultivation, the green and the white. They receive their names from the colour of their foot-stalks, but the variation is considered by some as fugitive, and that both are produced from seed obtained of the same plant; but this the experience of Mr. Sinclair denies. The French have three varieties of the white—the white, the red, and the yellow—which only differ from ours in having a larger foliage, and thicker, fleshier stalks, but they are less capable of enduring frost. They are cultivated for their stalks, which are cooked as asparagus. Mangel wurzel is sometimes grown for the same purposes, but as it is much inferior, the notice that it may be thus employed, is sufficient.

SOIL AND SITUATION.

Beets require a rich, mouldy, deep soil; it should, however, be retentive of moisture, rather than light, without being tenacious, or having its aluminous constituent too much predominating. Its richness should preferably arise from previous application, than the addition of manure at the time of sowing; and to effect this the compartment intended for the growth of these vegetables is advantageously prepared as directed for celery, On the soil depends the sweetness and tenderness of the red and yellow beets, for which they are estimated; and it may be remarked that on poor, light soils, or heavy ones, the

best sorts will taste earthy. Again, on some soils the better varieties will not attain any useful size, or even a tolerable flavour, whilst, in the same compartment, inferior ones will attain a very good taste. The situation should be open, and as free from the influence of trees as possible; but it is of advantage to have the bed shaded from the meridian sun in summer. I have always found it beneficial to dig the ground two spades deep for these deep rooting vegetables, and to turn in the whole or part of the manure intended to be applied, according to the richness of the soil near the surface, with the bottom spit, so as to bury it ten or twelve inches within the ground. Salt is a beneficial application to this crop, one reason for which undoubtedly is their being natives of the sea shore.

TIME, AND MODE OF SOWING.

Both species are propagated by seed, and may be sown from the close of February until the beginning of April: it being borne in mind that they must not be inserted until the severe frosts are over, which inevitably destroys them when in a young stage of growth. The best time for inserting the main crop of the beet root for winter supply, is early in March; at the beginning of July or August, a successional crop of the white beet may be sown, for supply in the winter and following spring.

It is best sown in drills a foot asunder, and an inch deep, or by dibble, at the same distance each way, and at a similar depth, two or three seeds being put in each hole: it may however be sown broadcast, and well raked in.

During the early stages of their growth, the beds, which, for the convenience of cultivation, should not be more than four feet wide, must be looked over occasionally, and the largest of the weeds cleared

away by hand. In the course of May, according to the advanced state of their growth, they must be cleared thoroughly of weeds, both by hand and small hoeing; the beet roots thinned to ten or twelve inches apart, and the white beet to eight or ten. The plants of this last species which are removed, may be transplanted into rows at a similar distance, and will then often produce a finer and more succulent foliage, than those remaining in the seed bed. Moist weather is to be preferred for performing this in; otherwise, they must be watered occasionally until taken root: they must be frequently hoed and kept clear of weeds throughout the summer.

It is a great improvement to earth up the stalks of the white beet in the same manner as celery, when they are intended to be peeled and eaten as asparagus.

TAKING THE BEET ROOT.

In October the beet root may be taken up for use as wanted, but not entirely for preservation during the winter until November or beginning of December, then to be buried in sand, in alternate rows, under shelter; or, as some gardeners recommend, only part at this season, and the remainder in February: by this means they may be kept in a perfect state for use until May or June. Others take them up entirely in December, and lay them in closely in a dry compartment of the garden, covering them with litter in frosty weather, to prevent their being frozen into the ground, but removing it during wet or mild weather. Before depositing in either of the above modes, the leaves, and fibrous roots must be trimmed off, and a dry day selected for performing it.

GATHERING FROM THE GREEN BEET.

In gathéring from the green beet, the largest outside leaves should be first taken, and the inner ones

left to increase in size, when the same selection must be continued; but at the same time it must be remembered, that they must be used whilst perfectly green and vigorous, otherwise they are tough and worthless. If prevented running to seed, they will produce leaves during the succeeding year; but as this second year's production is never so fine or tender, an annual sowing is usually made.

TO OBTAIN SEED.

For the production of seed, some roots must be left where grown, giving them the protection of some litter in very severe weather, if unaccompanied with snow; or if this is neglected, some of the finest roots that have been stored in sand, and have not had the leaves cut away close, may be planted in February or March. Each species and variety must be kept as far away from the others as possible, and the plants set at least two feet from each other. They flower in August and ripen their seed at the close of September. Seed of the previous year is always to be preferred for sowing, but it will succeed if carefully preserved when two years old.

BORAGO.

Supposed from corago, *or* cor, *the heart, and* ago, *to give, alluding to the renovating power of which it was supposed to be possessed.*

BORAGO OFFICINALIS.—BORAGE.

SOIL AND SITUATION.

For the spring and summer sowing any mouldy soil and open situation may be allotted, provided the

first is not particularly rich; but for those which have to withstand the winter, a light dry soil, and the shelter of a south fence is most suitable. A very fertile soil renders it super-luxuriant, and injures the intensity of its flavour.

TIMES AND MODE OF SOWING.

It is propagated by seed, which is sown in March or April, and at the close of July for production in Summer and Autumn, and again in August or September for the supply of winter and succeeding spring. These sowings may be performed broadcast and regularly raked in, but preferably in shallow drills six inches asunder. When of about six weeks' growth the plants are to be thinned to six inches apart, and the plants thus removed of the spring and autumn sowings may be transplanted at similar distances, but those of the summer seldom will endure the removal, and at all times those left unmoved prosper most. At the time of transplanting, if at all dry weather, they must be occasionally watered moderately until established; water must also be frequently applied to the seed-bed of the summer sowings, otherwise the vegetation will be slow and weak. They must be kept perfectly clear of weeds.

TO OBTAIN SEED.

To save seed some of those plants which have survived the winter must be left ungathered from. They will begin to flower about June, and when their seed is perfectly ripe, the stalks must be gathered and dried completely before it is rubbed out.

BRASSICA.

From πρασιχη, a garden herb, or perhaps from brachia, *from its numerous sprouts.*

SOIL AND SITUATION.

For the seed-bed the soil should be moist, mouldy, and not rich, but for final production it should be a fresh moderately rich clayey loam, though very far removed from heavy, as they delight in one that is free and mouldy. Such crops as have to withstand the winter may have a lighter compartment allotted to them; the savoy, in particular, requires this, though it may be as rich as for the other crops without any detriment: an extreme of richness is, however, for all the crops to be avoided. The ground is advantageously dug two spades deep, and should be well pulverised by the operation. Stable manure is usually employed in preparing the ground for this genus, but Mr. Wood, of Queensferry, N. B., who has for the greater part of his life paid particular attention to the cultivation of broccoli, recommends the following compositions in preference for that vegetable, and we are justified in concluding that they would be equally beneficial to all the other species. The manure collected from the public roads used alone causes the plants to grow strong, but with small heads. A mixture of road-rakings, sea-weed, and horse-dung is better. A manuring of the compartment, on which they were intended to be planted, with sea-weed in autumn, digging it up rough, repeating the application in spring, and pointing the ground before planting, produced the finest heads he had ever seen; but the compost of all others most suitable to them, is one composed of the cleanings of old ditches, tree leaves, and dung*.

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* Mem. Caled. Hort. Soc., vol. ii. p. 265.

The situation must in every instance be free and open, though for the summer crops it is advantageous to have them shaded from the meridian sun. They must never, however, be under the drip of trees, or in confined situations, for in such they, and especially savoys, are most subject to be infested with caterpillars, and to grow weak and spindling.

GENERAL OBSERVATIONS.

In planting brassicas, it should be observed whether the roots of the plants are knotted or clubbed, as such should be rejected, or the excrescence entirely removed.

BRASSICA OLERACEA.—CABBAGE.

VARIETIES.

There are numerous varieties of the cabbage, which may be divided into three classes, as most appropriate for sowing at an equal number of periods of the year. It may be here remarked, that, for family use, but few should be planted of the early varieties, as they soon cabbage, harden, and burst; on the contrary, the large York, and others that are mentioned in the middle class, though not far behind the others in quick cabbaging, never become hard, and continue long in a state fit for the table.

For First Crops.

Early Dwarf.
York.
Early Dwarf Sugar Loaf.
    Battersea.
    Imperial.
East Ham.

Midsummer Crops.

Large Early York.
Large Sugar Loaf.
Early Battersea. } These mentioned again as being
Imperial. } valuable for successional crops also.
Penton.—This is valuable in late summer, when other varieties are strongly tasted.
Antwerp.
Russian.—To have this in perfection, the seed must be had from abroad, as it soon degenerates in this country.
Early London Hollow.
Musk is excellent at any period, but is apt to perish in frosty weather.

For Autumn, &c.

Large Hollow Sugar Loaf.
Oblong Hollow.
Long sided Hollow, and any of the preceding.
Red Dutch for pickling.

TIME AND MODE OF SOWING.

The cabbage is propagated by seed, the sowing of which commences with the year. Towards the end of January, on a warm border, or under a frame, a small portion of the early and red cabbages may be sown, to come first in succession after those which were sown in the August of the preceding year. A sowing may be repeated after intervals of a month during February, and until the close of July of the second or larger class, and from May to July of the third class of varieties. In August a full and last crop must be sown of the first class, as well as of the second, both to plant out in October, November, and December, as to remain in the seed-beds for final removal in the February and two succeeding months

of the next year; this sowing is best performed during the first or second week of the month; if sown earlier they are apt to run in the spring, and if later, will not attain sufficient strength to survive the winter. By these various sowings, which, of course, must be small ones for a private family, a constant supply is afforded throughout the year. The seed is inserted broadcast rather thin, and raked in evenly about a quarter of an inch deep. The bed is advantageously shaded with mats, and occasionally watered until the plants are well above ground, and the waterings may afterwards be beneficially repeated two or three times a week until they are ready for removal, if dry, hot weather continues. The seedlings arising from these various sowings, when of about a month's growth, or when they have got four or five leaves an inch or so in breadth, are, by those who are advocates for transplanting, pricked out in rows four or five inches asunder each way; they must be shaded and watered until completely established: those of the August sowing that are pricked out, are to remain until the next spring, and those which are left in the seed-bed are employed for planting in October and two following months.

When of six or eight weeks growth, they are of sufficient size for planting, which they are to be in rows from one and a half to two and a half feet asunder each way; the smaller early kinds being planted the closest. The red cabbage, the principal plantation of which should be made in March for pickling in September, is benefited by having the distances enlarged to three feet. They must be well watered at the time of removal, and frequently afterwards, until fully established, in proportion as dry weather occurs. They must be frequently hoed to keep under the weeds, as perhaps no plant is more injured by them than the cabbage, and as soon as

their growth permits it the earth should be drawn round the stems of the plants. To promote the cabbaging of the plants, when requisite, it is useful to draw the leaves together with a shred of bass-mat, which forwards it about a fortnight. If any plants advance to seed whilst very young, the deficiencies should be immediately filled up. The stems of the summer and autumn crops, if left after the main head has been cut, will produce numerous sprouts during those seasons, and continue to do so throughout the winter.

TO OBTAIN SEED.

For the production of seed in October, which is the preferable season, and from thence until the close of February, some of the finest and best cabbage plants must be selected; or in default of these, though not by any means to be recommended, such of their stalks as have the strongest sprouts. They must have the large outer leaves removed, and then be inserted up to their heads, in rows three feet asunder each way. Each variety must be planted as far from any other as possible, as indeed from every other species of brassica, and this precaution applies equally to those which will be subsequently dwelt upon. The red cabbage especially must be kept distinct. Some plants of the early varieties should be planted in sheltered situations, as in severe winters they are apt to run prematurely. The seed ripens in early Autumn; but for the treatment required during its growth, see Broccoli.

FRAME SEEDLINGS.

The first sowing of the year in a hotbed must be carefully attended to. The heat must never exceed

55°, nor sink more than two or three degrees beneath 50°, which is the most favourable minimum; otherwise will be weak and tender, or checked and stunted. Air should be admitted freely in the day, and the glasses covered, as necessity requires, at night with matting; the other offices of cultivation are the same as for plants raised in the open ground.

COLEWORTS.

One of the Latin names for cabbage is *caulis*, and from this is derived cale or cole and colewort. Coleworts now merely signify cabbages cut young, or previous to their hearts becoming firm, the genuine colewort or Dorsetshire cale being nearly extinct.

VARIETIES.

The varieties of cabbage principally employed for the raising coleworts are the large York and sugar loaf, as they afford the sweetest; but the early York and East Ham are also employed, as also occasionally the Battersea, imperial, Antwerp, and early London hollow. When large coleworts are in request, the great spreading varieties should never be employed.

Sowings may purposely be performed during the middle of June and July, to be repeated at the end of the latter month, for transplanting in August, September, and October, for a continual supply from September until the close of March. A fourth must be made the first week in August for succeeding the others in spring; but, if of sufficient extent, these various plantations may be made from the seed-beds of the cabbage crops made at these several periods, as directed under that head; as the chief object in growing coleworts is to have a supply of greens

sooner than can be obtained from the plantations of cabbages if left to form hearts.

The observations upon transplanting, and the directions for cultivating cabbages, apply without any modification to coleworts; but the distance at which the plants may be set is much less; if the rows are a foot apart, and the plants seven or eight inches distant from each other, an abundant space is allowed. As mentioned for cabbages, the heading is greatly forwarded by their leaves being drawn together so as to enclose the centre. They may be cut when the leaves are five or six inches in breadth; the most preferable mode of taking them is to pull up, or cut every other one; these openings are beneficial to the remaining plants; and some, especially of the August raised plants, may be left, if required, for cabbaging.

BRASSICA OLERACEA SABAUDA—SAVOY.

DESCRIPTION.

The savoy, which is one of the best and chief of our vegetable supplies during the winter, derives its name either from being an introduction from that part of Europe with which it bears a similar name; or, otherwise, is a corruption from the French *savourer*. All its varieties may be denominated hardy, being generally rendered more sweet and tender by frost, though not all equally capable of withstanding the rigour of winter.

VARIETIES.

There are three varieties of savoy, the yellow, the dwarf, and the green, and of each of these there are likewise two sub-varieties, the round and the oval-

headed, the first of which is the most permanent. Each variety has been described by Mr. Morgan, gardener to H. Browne, Esq., of North Mimms.

TIME AND MODE OF SOWING, &c.

Like the other members of this tribe it is propagated by seeds; the first sowing to take place at the close of February, the plants of which are ready for pricking out in April, if that practice is adopted, and for final planting at the end of May, for use in early Autumn; this to be repeated about the middle of March, the plants to be pricked out in May, for planting in June, to supply the table in autumn and early winter; lastly, the main crops must be sown in April and early May, to prick out and plant after similar intervals for production in winter and spring. The seed is sown broadcast thinly, and raked in as mentioned for other species of Brassica.

PRICKING OUT.

The plants are fit for pricking out when they have four or five leaves about an inch in breadth; they must be set three or four inches asunder each way, being both here and in the seedbed kept well cleared of weeds.

PLANTING.

When finally removed, the plants of the first crops should be set out two feet apart each way from one another; but the winter standing crops are better, at two feet by eighteen inches. Both before and after every removal, they should be watered abundantly if the weather is at all dry; and this applicatlon to be continued until the plants are well established. The only after-culture required is the keeping them clear of weeds by frequent broad-hoeing, and the earth drawn up two or three times, about their stems. For fuller directions, see CABBAGE, &c.

TO SAVE SEED.

For the production of seed such plants must be selected of the several varieties as are most true to their particular characteristics, and as are not the first to run. These, in open weather, from early in November to the close of February, the earlier however the better, may be taken up with as little injury as possible to the roots, and the large under leaves being removed, planted entirely up to the head, in rows two feet and a half each way, each variety as far from the other as possible. They flower in May or June, and ripen their seed in July and August. See Cabbage.

BRASSICA OLERACEA FIMBRIATA—BORECOLE.

1. Brussels Borecole.
2. Green Borecole (Brassica oleracea selenisia).
3. Purple Borecole (B. oleracea laciniata).
4. Variegated Borecole.
5. German, or Carled Kale or Curlies.
6. Scotch, or Siberian Kale, (B. o. sabellica.)
7. Chou de Milan.
8. Egyptian or Rabi Kale.
9. Ragged Jack.
10. Jerusalem Kale.
11. Buda, Russian, Prussian, or Manchester Kale.
12. Anjou Kale.

TIME AND MODE OF SOWING.

Like the other members of this tribe it is propagated by seed. The first crop to be sown about the close of March, or early in April; the seedlings of

which are fit for pricking out towards the end of April, and for final planting at the close of May for production late in autumn, and commencement of winter; the sowing must be repeated about the middle of May; for final planting, during July, and lastly in August, for use during winter and early spring.

PRICKING OUT.

If transplanting is adopted, their fitness for pricking out is known when their leaves are about two inches in breadth; they must be set six inches apart each way, and watered frequently until established. In four or five weeks they will be of sufficient growth for final removal.

PLANTING.

When planted, they must be set in rows two feet and a half apart each way; the last plantations may be six inches closer. They must be watered and weeded as directed for the other crops; as they are of large spreading growth, the earth can only be drawn about their stems during their early growth. If during stormy weather any of those which acquire a tall growth are blown down, they must be supported in their erect posture by stakes, when they will soon firmly re-establish themselves.

TO RAISE SEED.

For the production of seed, such plants of each variety as are of the finest growth, and are true to the characteristics primarily given, must be selected, and either left where grown, or removed during open weather in November or before the close of February, the earlier the better, into rows three feet apart each way, and buried down to their heads. The seed ripens about the beginning of August.

BRASSICA OLERACEA BOTRYTIS—CAULIFLOWER.

VARIETIES.

There are two varieties;—the early, which is smallest and most fit for growth under lights, for the winter standing crop, and the large, for the open ground plantations.

TIME OF SOWING.

It is propagated by seed; the first sowing to take place at the close of January or early in February, in a slight hot-bed, or warm border, in either situation to have the protection of a frame; the plants are fit to be pricked out in March in similar situations; and for final removal into the open ground during April and May; and some to be placed under hand-glasses for the more immediate succeeding the winter standing crop. At the beginning of March and April another sowing is to be performed in a sheltered border, the seedlings of which may be pricked out in May, and planted finally in June for production at the end of summer. Again in the last week of May; time for pricking out June; and final planting the end of July; to produce during October and November, and in favourable seasons until Christmas.

AND MODE.

The seed of these sowings must be inserted broadcast, and covered half an inch thick with fine mould. The seedlings are of sufficient size for pricking out when they have four or five leaves, about an inch in breadth; they must be set three or four inches apart each way. Water must be given moderately both in the seed-bed, and at the time of removal, if the

weather is at all dry. When finally set out they must be planted in rows two inches and a half apart each way. The mould must be frequently loosened by the hoe, and drawn up about their stems. In dry weather during summer, a cup should be formed round each plant and filled twice a week with water, but as soon as the flower makes its appearance it must be applied every other day. As the head appears exposed, some of the leaves are advantageously broken and turned over it as a shelter from the sun, which preserves them from becoming of a yellow hue, as well as retards their advancing to seed.

WINTER STANDING CROP.

TIME OF SOWING.

The seed for this crop must be sown in the third week of August, in a warm border or an old hot-bed, with the protection of a frame or hand glass. That the cauliflower, though the most tender of the brassica tribe, is not so impatient of cold as some gardeners are led to imagine, is demonstrated by the fact, that the imperfect covering of mats will almost always preserve the plants uninjured through the winter, and the practice of Mr. Bull, of Rossie Priory, N. B. proves that it is scarcely more so than the brocoli. He sows in the last week of August, transplants in the middle or end of November, and often does not even afford them the protection of a south wall, and no description of covering. Plants thus raised are healthier, and produce finer heads than those which have additional shelter, though they are not so forward, neither are they subject to be *black shanked**.

* Mem. Caled. Hort. Soc. vol. iii, p. 192.

The chief object, therefore, of growing in a frame is early production, and by repeating the sowing according to Mr. Bull's mode, we have the means of obtaining an unbroken supply, as they will immediately succeed the frame plants, and anticipate those of the January sowing.

MODE OF SOWING.

The seed beds, if not one that has grown cucumbers, &c., must be well manured with dung from that source, or, as is sometimes recommended, a basis five or six inches thick of it in a perfectly decayed state must be formed, firmly trodden down, and covered with a similar thickness of light, rich mould; in this the seed is to be sown and buried a quarter of an inch deep, and during the meridian of hot days shaded with matting. Moderate waterings must be given as may appear necessary. The plants appear in about a week, and the shading and watering must in like manner be afforded.

The plants are fit for pricking out at the close of September, when their leaves are rather more than an inch wide; and are to be placed in a similar soil and situation to that from which they were removed. Towards the end of October, or first week in November, they must be removed, and planted in patches of from three to six together; these clusters being in rows three feet apart each way, to be sheltered with hand-glasses until the spring. Others may be planted four inches asunder in a frame on a sheltered border, or in default of this, occasionally during excessive wet or inclement weather, and at nights, with matting until the same season. Water must be given at the time of these several removals until the plants are established and occasionally, but in small quantities afterwards as may appear to be required. They must never be exposed to excessive wet from rain or

otherwise, or they will inevitably become *black-shanked*, which is the technical name for a complete decay of their stems close to the ground. The soil on which the plants are set in clusters, as directed above, ought to be rich and moderately moist, protected to the N. E. and W. by pales, or more advantageously by reed fencing. If the soil is wet, but not otherwise, it must be laid out in ridges about six inches high and two feet wide, and the patches formed down the centre of each.

Water must be given moderately, and the glasses kept closed for eight or ten days, before which the plants are not fully established. Air must be admitted freely afterwards, by raising the backs of the frames three or four inches daily, and propping up the hand-glasses to the same height on the S. side. During warm light showers they may be taken off entirely; but in cold days and at nights they must be closed, as also during snow or heavy rain: the additional covering of mats, &c., is also required in severe weather. The decayed leaves must often be picked off and the earth between the plants gently stirred in search of slugs which take refuge there from the cold, and often injure them at this season. A little salt, or ley of soap, may with advantage be scattered over the surface for the destruction of these vermin.

At the end of February, if an open season, or not until March if otherwise, part of the plants may be removed from under the hand-glasses, two strong ones being left under each, and set out in the open ground; but the soil and sheltered situation being as nearly similar to that from which they are taken as possible. Some also may be planted out from the frames, but from either situation these removals must be concluded by the middle of April. Care must be taken to remove the plants with as much earth as possible

retained to their roots, and they are to be planted at a similar distance as was recommended for the other open ground crops.

Those continued under the glasses must have air admitted as freely as possible, and other precautions adopted that were recommended during their winter growth. Earth should be drawn carefully about their stems without any being allowed to fall into their hearts. When they fill the glasses these last are easily raised by a circular mound four or five inches high thrown up round them. In mild weather, hot sunny days, and during genial showers the glasses may be taken completely off, but renewed at night; being thus hardened by degrees, and when all danger of frost is past about the end of April or early in May they may be entirely removed. The leaves are to be broken down over the heads as before directed.

FITNESS FOR USE.

When a cauliflower has arrived at its full size, which is shown by the border opening as if it was about to run, it is best to pull up the plant entirely, it being useless to leave the stem exhausting the ground, as it never produces any useful sprouts; and if laid thus entire in a cool place it may be preserved for several days. It is by no means indifferent at which period of the day a cauliflower is pulled; the best time is early of a morning before the dew is evaporated; if it is done during the meridian or afternoon of a hot day, it loses much of its firmness, and boils tough.

TO PRESERVE FROM FROST.

As frost destroys the cauliflower, it is a practice in November before it sets in, to pull up the late standing plants, and the leaves being tied over the

head, to hang each up in a cool shed or cellar, by which means they remain good for some time. But a much better mode is after using the same preparatory precautions to bury them in sand, laying them in alternate layers with the earth, in a dry situation, by this means they may be preserved to the close of January. The means Mr. Smith of Keith Hall, N. B., adopts for preserving them, is by pulling them up as entire as possible during a dry day in November, and, the leaves being lapped round the flower, to bury them in a trench previously dug at the bottom of a wall, eighteen inches wide and deep, the plants being laid with their roots uppermost in an inclining position, so that the roots of the second cover the top of the one preceding. The earth is laid over them thick, a considerable slope given to it, and beaten smooth with the spade to throw off the rain. The plants are thus preserved in a good state until the January following *.

TO OBTAIN SEED.

For the production of seed, some plants of the winter standing crop which have fine and firm heads must be selected, as these will produce the best seed, thougth not in such quantity as those of a looser texture. For the necessary treatment see "Brocoli." The seed ripens in September, and the branches should be gathered as soon as this occurs, and not allowed to remain until the whole is fit for collecting. The seed remains, if carefully preserved, in a good state for use, until it is three or four years old †.

* Mem. Caled. Hort. Soc., vol. i. p. 129.
† Quintin's Complete Gardener, vol. ii. p. 309.

BRASSICA OLERACEA BOTRYTIS.—BROCOLI.

VARIETIES.

The varieties are now numerous, and are chiefly the fruits of the great attention which has been paid to its cultivation of late years. For an uninterrupted supply scarce any of these varieties can be dispensed with; but the purples and white are those most generally cultivated. With respect to their quality, it has been remarked that those have less of their peculiar alkalescent taste, and are more palatable in proportion as they approach a pale or white colour*.

1. Purple Cape, or Autumnal Brocoli.
2. Green Cape, or Autumnal Brocoli.
3. Grange's early Cauliflower Brocoli.
4. Green, Close-headed Winter Brocoli.
5. Early Purple Brocoli.
6. Early White Brocoli.
7. Dwarf Brown, Close-headed Brocoli.
8. Tall, large-headed Purple Brocoli.
9. Cream-coloured or Portsmouth Brocoli.
10. Sulphur Coloured Brocoli.
11. Spring White, or Cauliflower Brocoli.
12. Late Dwarf, close-headed Purple Brocoli.
13. Latest Green, Siberian, or Spanish Brocoli.

TIME AND MODE OF SOWING.

Brocoli is propagated by seed, as all of the kinds are not generally at command, the following times and varieties are specified as being those employed in

* Trans. Hort. Soc. Lond., vol. i. p. 116.

general practice, and by which a supply nearly unfailing is accomplished. A first sowing may be made under a frame at the close of January, and a second at the end of February, or early in March, on an eastern wall-border, of the purple cape and early cauliflower varities, for production at the close of summer and during autumn; the seedlings from these sowings, are respectively fit for pricking out, if that practice is followed, in March and early April, and for final planting at the close of the latter month and May. In April, another crop of the same varieties may be sown, for pricking out in May, and planting in June, to produce at the close of autumn and in early winter. During middle of May, a fourth and larger crop than any of the preceding, of the early purple and white varieties to be pricked out in June and planted in July; and finally, the last open ground crop, may be sown in June, to be pricked out in the succeding month, and planted in August and September; the plants will follow from the others in succession throughout winter and spring. In a frame, however, they may be sown like the cauliflower in the last days of August to remain until the following March, to be then planted out for production in early summer; by these repetitions, which, if for a family should be small, an almost continued supply is afforded; but in general for domestic use, especially if the establishment is small, three sowings of moderate extent will be sufficient, the first in the second week of April, the second in the third week in May, and the third in the middle of August in a frame. Each variety should be sown separately; and the sowing performed thin, the beds not more than three or four feet wide for the convenience of weeding, which must be performed as often as weeds appear, as they are very inimical to the growth of this vegetable. The seed must not be

buried more than half an inch; and the beds be netted over to keep away the birds, which, especially in showery weather, are very destructive.

PRICKING OUT.

The fitness of the plants for pricking out is intimated by their having five or six leaves, rather more than an inch in breadth; they are set four or five inches apart each way, and water given every night until they have taken root. They must have four or five weeks' growth before they are again moved; or not until they have leaves nearly three inches in breadth.

PLANTING.

When planted out, they must be set on an average two feet asunder each way; in summer a little wider, in winter rather closer. Water to be given at the time of planting, and occasionally afterwards until they are established; during the droughts of summer it may be given plentifully with the greatest advantage. They must be hoed between frequently, and the mould drawn up about their stems. To force forward the winter standing varieties, it is a successful practice to take them up in November, and after trimming off the outer leaves to lay them on their sides in a sloping position, in a bank or terrace of light earth, so much space being left between every two plants that their heads do not come in contact.

PROTECTION IN WINTER.

To continue the supply uninterrupted even in the mid-winter of the severest years, Mr. Maher recommends that when the crop sown about the third week in May has been planted out, the weaker plants which remain should be left eight or ten days to acquire strength, and then planted in pots (sixteens),

filled with very rich compost; to be shaded, and watered until struck. These are to be plunged in the ground at similar distances as the main crops, and about three inches below the surface, so as to form a cup for retaining water round each: these cups are filled up by the necessary earthings, which must be pressed firmly down to prevent the wind loosening them. A few of the plants generally flower early; and, to guard against the first frosts, must have the leaves broken over them: but on the approach of settled frost in December or January, the pots must be taken up and removed into a frame, shed, or any place of shelter from the extreme severity of the weather; but to have air when mild *.

To those crops which have to withstand the winter in the open, salt is beneficially applied, as it preserves them from being *frosted in the neck:* this application preserves their roots from being worm-eaten; which may also be effected, Mr. Mackay of Errol House, N.B. informs us, by pouring soapsuds between the rows, which application is also very beneficial to the plants*.

To preserve the winter standing crops from destruction by severe weather, it is also a practice, early in November, to take them up, injuring the roots as little as possible, and to lay them in a sloping direction in the soil, with their heads to the north. A modification of this plan, adopted by the distinguished President of the Horticultural Society, is however much preferable, as it obviates the defect of few roots being produced, and consequently diminutive heads. A small trench is made in the first week of September, at the N. end of each row, in which the adjoining plant is laid so low, that the centre of

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* Trans. Hort. Soc. Lond., vol. i. p. 118.

† Mem. Caled. Hort. Soc., vol. i. p. 275.

its stems at the top is put level with the surface of the ground, the root being scarcely disturbed; it is then immediately watered, and its roots covered with more mould. Thus every plant is in succession treated; and by the beginning of November, it is scarcely perceptible that they have been thus treated, though it certainly checks their growth. Before the arrival of snow, a small hillock must be raised round each plant, to support its leaves and prevent their being broken *. If snow accompanies severe frost, advantage should be taken of it, and the plants be heaped over with it, which will afford them an effectual protection.

TO OBTAIN SEED.

For the production of seed, such plants of each variety must be selected in March or April as most perfectly agree with their peculiar characteristics, and are not particularly forward in advancing for seed. As the stems run up, some gardeners recommend the leaves to be taken away, but this must be injurious. Mr. Wood of Queensferry, N.B. is particularly careful that no foliage appears on the surface of the flower; he always lifts his plants, and plants them in another bed, watering abundantly; as this, from his long experience he finds, prevents their degenerating, or producing *proud seed*, and when the head begins to open, he cuts out its centre, and leaves only four or five of the outside shoots for bearing. The sulphur coloured he always finds it the most difficult to obtain seed from †. As the branches spread, four or six stakes should be placed at equal distances round each plant, and hooped round with string to support them and prevent their breaking. When the pods

* Trans. Hort. Soc. Lond., vol. ii. p. 304.

† Mem. Caled. Hort. Soc., vol. ii. p. 266.

begin to form, water should be given repeatedly, and occasionally some thrown over the whole plant, which tends to prevent mildew. Before the pods begin to change colour, those from the extremity of every shoot must be taken away, as these yield seed which produce plants very apt to run to seed without heading, and by an early removal the others are benefited. The branches ought to be gathered as soon as the pods upon them ripen. Varieties must never be planted near each other, or they will reciprocally be contaminated. The seed ripens in August or September; and it is often recommended to preserve it in the pod until wanted; but the general practice is to beat it out, and store it as soon as perfectly dry.

The plants raised in frames, are managed as directed for cauliflowers in the same situation.

BRASSICA RAPA—TURNIP.

DESCRIPTION.

THIS root was in considerable estimation with the Romans; Cato is the first writer amongst them that mentions it: "sow it," he says, "after an autumnal shower, in a place that is well manured, or in a rich soil."

VARIETIES.

There are numerous varieties.

For the first sowings.
1 Early white Dutch.
2 Early stone.
For the spring sowings.
3 Common round white.

4 Large round white.
5 Large green-topped.
6 Large red-topped.
7. Yellow Dutch.
8. Tankard.
9. French.
10. Small round French.
11. Swedish.
12. Moscow, or Narva.

TIME OF SOWING.

It is propagated by seed, the sowing of which may commence at the end of February, a small portion on a warm border, and some in a moderate hotbed, of the two first varieties mentioned; these will be fit for use during April. The sowing on a border to be repeated in the beginning of March, and as the former will soon run to seed at its conclusion, these will produce throughout May. These sowings are to be repeated in small proportions at monthly intervals, until the beginning of July, when the main crop for the supply of the winter may be inserted; and finally small crops, at the commencement of August, and September, for spring.

MODE.

The seed is to be inserted broadcast, regularly, and very thin, an ounce being sufficient for five or more square rods (151 sq. yards), and to enable this to be distributed regularly, it is a good practice to mix it well with sand before sowing. Each sowing should, if possible, be performed in showery weather, if otherwise, it must be moderately watered at the time of insertion, and three times a week afterwards: if the water is put on in too great a quantity at a time, it is apt to wash the seed to the surface: it must be

trod in, before the ground is raked; if drilled, it must be done so an inch deep, and twelve inches asunder.

THINNING.

The plants are fit for thinning when they have four or five leaves about two inches in breadth. The early crops may at once be thinned to eight inches apart; but the plants of main ones, which must finally stand at least twelve asunder from each other, being benefited by two or three hoeings, may at first be only set out to about six, and then thinned when grown to a moderate serviceable size, by removing every other one. Weeds are more than ordinarily injurious to this crop, causing them to spindle into large luxuriant tops and small bulbs; this injury is likewise effected by allowing the plants to grow too close. Water must be given frequently and plentifully, as on a regular supply of moisture depends in a great measure their goodness.

In November or December, before the setting in of frost, some of the bulbs must be taken up, and the tops and roots being removed, preserved under shelter in sand.

The young tops are much in request, during spring; they must be gathered when very young, otherwise they are strong flavoured and bitterish.

TO OBTAIN SEED.

For the growth of seed, some of the most perfect roots of those which will withstand the winter, may remain where grown; or they may be transplanted in November or February if necessary, which some gardeners indeed consider the only way to obtain good seed. Of the two earliest varieties, sown on a border early in March, some of the bulbs being allowed to remain will produce seed the same autumn. The plants must at least stand two feet

apart each way. They must be carefully freed of weeds; and especial care taken to keep away birds, as they are particularly voracious of the seed of this and of all other species of brassica. When ripe, in July or August, the stalks are cut, and, when perfectly dry, beaten out and stored. No two varieties must be allowed to grow together.

BRASSICA OLERACEA, NAPO-BRASSICA.

Turnip Cabbage, and Turnip-rooted Cabbage.

THESE species of brassica are but little cultivated, and at most a very small quantity of each is in request. The bulbs, for which they are cultivated, must have their thick outer skin removed, and in other respects treated as turnips in preparing them for use.

VARIETIES.

Of the turnip cabbage, which is so named on account of the round fleshy protuberance that is formed at the upper end of the stem, there are four varieties.

1. White Turnip Cabbage.
2. Purple Turnip Cabbage.
3. Fringed Turnip Cabbage.
4. Dwarf Early Turnip Cabbage.

Of the turnip-rooted cabbage, which is distinguished from the above by its root having the protu-

berance near the origin of the stem, there are two varieties, the white and the red*.

TIME AND MODE OF SOWING.

They are propagated by seed, which may be sown broadcast or in drills at monthly intervals in small quantities, from the commencement of April until the end of June.

PLANTING.

The best mode is to sow thin, in drills two feet and a half apart, and allow the plants to remain where sown, the plants being thinned to a similar distance apart; or, if sown broadcast, to allow them to remain in the seed-bed until of sufficient size to be removed into rows at similar distances for production, rather than, as is the practice of some gardeners, to transplant them, when an inch or two in height, into a shady border in rows three inches apart each way, to be thence removed as above stated.

Water must be given every night after a removal until the plants are again established; and afterwards in dry weather occasionally, as may appear necessary.

Earth may be drawn up to the stem of the turnip cabbage as to other species of brassica; but the bulb of the turnip-rooted must not be covered with the mould.

For directions to obtain seed, &c., vide Brocoli, Turnip, &c.

BRASSICA NAPUS.—RAPE OR COLE SEED.

It is propagated by seed, and, like mustard, and other small salading, may be sown at any period of

* Trans. Hort. Soc. Lond., vol. v. p. 18—24.

the year, when in request; being allowed a separate bed. It is cultivated as mustard, which see.

TO OBTAIN SEED.

For the production of seed, some plants of a sowing which has been made about the middle of July, must be thinned to about eighteen inches apart; they will survive the winter, and flower in the May and June of the next year. The seed, which is produced in great abundance, ripens in July and August. It must be cut as it does so, and laid upon cloths to dry, as it is very apt to shed.

EDIBLE-ROOTED RAPE.

This name may be applied to a variety of the rape mentioned by Mr. Dickson, one of the vice-presidents of the Horticultural Society. Its root is white, and carrot-shaped, about the size of the middle-finger. It is much more delicate in flavour than the turnip, like which root it is cooked, only that it is not peeled, but scraped, its skin being remarkably thin. It has been cultivated for a great length of years on the Continent, and for about thirty years in this country, but only by one person, as far as Mr. Dickson is aware.

TIME OF SOWING.

It is propagated by seed, which, for the main crop, may be sown from the middle of July to the end of August, or even later: these will supply the table until April; and, if wanted throughout the year, a little may be sown in the latter end of October, the plants from which will be fit for use, if they succeed,

during April and May: the last crop to be inserted from the middle of January to middle of February, which will come in at the end of May, and during June. On a north border, and if the soil is sandy and moist, it is possible to have them sweet and tender during the whole summer, to effect which the seed must be sown at the close of March and May.

CULTIVATION.

They require the same modes of cultivation and treatment as turnips. In dry weather the beds must be watered regularly, until the plants have got three or four leaves.

SOIL.

One great advantage attending the cultivation of this vegetable is, that it requires no manure. Any soil that is poor and light, especially if sandy, is suitable to it. In rich manured earth, it grows much larger, but not so sweet and good.

TO OBTAIN SEED.

For the growth of seeds Mr. Dickson recommends, in February or March, some of the finest roots to be transplanted to two feet asunder; but it would, perhaps, be a better practice to leave them where grown. The ground is to be hoed repeatedly, and kept clear of weeds. The seed must be cut as soon as ripe, and treated as directed for turnips, &c.*

* Trans. Hort. Soc. Lond., vol. i. pp. 36—39.

CALENDULA.

The diminutive of Caltha, *the former name of the Marigold,* a calathi forma, *because, when slightly expanded, the flowers resemble a basket.*

CALENDULA OFFICINALIS—MARIGOLD.

VARIETIES.

There are several varieties.

1. Single.
2. Common double.
3. Largest very double.
4. Double lemon-coloured.
5. Great Childing.
6. Small Childing.

The single-flowered, and those which have the darkest orange colour, are most esteemed, as possessing the most flavour.

SOIL AND SITUATION.

The soil most suited to them is one that is light, dry, and poor. In rich ground they grow larger and more luxuriant, but lose much of their flavour and medicinal quality. The situation cannot be too open and exposed.

TIME AND MODE OF SOWING.

It is raised from seed, which may be sown from the close of February until June; or it may be performed in autumn, during September. If left to themselves, they will never fail to multiply innumerously, from the self-sown seed. They are usually sown broadcast, and raked in, or in drills, ten inches apart; the plants are best left where raised, being

thinned to ten or twelve inches asunder; but when the seedlings are two or three inches in height, they may be removed into rows at similar distances as above. Water must be given moderately every other day, until established.

GATHERING.

The flowers, which the spring-raised plants will produce in the June of the same year, but those of autumn not until that of the following one, will be fit to gather for keeping in July, when they are fully expanded, as well as for use when required. Before storing, they must be dried perfectly, otherwise they become mouldy and decay.

TO OBTAIN SEED.

For the production of seed, plants of each variety must be grown as far distant from each other as may be. The two Childing, and the Largest double Marigolds, are especially liable to degenerate, if the seed is not carefully taken from the largest and most double flowers.

CAMPANULA.

The diminutive of campana, *a little bell, from the shape of the Corolla.*

CAMPANULA RAPUNCULUS.—RAMPION.

SOIL AND SITUATION.

The soil ought to be moderately moist, but it must not be too tenacious. A shady border of rich and

moderately stiff earth is considered by Mr. Dickson, one of the vice-presidents of the Horticultural Society, to be most favourable; the mould being made as fine as possible*. If it is cloddy, or subject to bind and crack in hot weather, the plants will refuse to thrive.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown during March, April, and May; the plants from sowings in the two first months soon, however, run up to seed. The insertions may be performed either in drills six inches apart, or broadcast; in either mode the seed to be buried half an inch deep, effecting it in the latter by sifting mould over it; for, as Mr. Dickson observes, if the seed is raked in, from its minuteness, it is apt to be buried too deep. The plants are to remain where sown; though in case of any deficiency, those which are taken away in thinning the crops, may be transplanted successfully, if it is performed with the precautions directed by the abovementioned horticulturist, namely, to remove them to a border similar to the seed bed, and to insert the roots perpendicular, and without pressing the mould too close about them †. The best time for performing the removal is of an evening.

They are fit for thinning when of six or eight weeks' growth, or what is a more positive indication, when about two inches in height; they must be set at a distance of six inches apart, being hoed at the time, and the same operation repeated two or three times, which, if performed in dry weather, will keep them free from weeds until used.

The plants of the sowings during the two first

* Trans. Hort. Soc. Lond., vol. iii. p. 20.

† Ibid.

mentioned months will be fit for use at the close of August, or early in September, and continue throughout the autumn. Those of the last one will continue good throughout the winter, and until the following April. The soil, throughout their growth, must be kept moist, effecting it in dry weather by giving frequent but moderate waterings through the fine rose of a watering pot.

The root, for which it is cultivated, either to be sliced, together with its leaves, in salads, or eaten as the radish, as well as to be boiled like asparagus, is most palatable when drawn young, and eaten fresh from the ground.

TO OBTAIN SEED.

For the production of seed, a few of the winter standing plants are left unmoved. These shoot up in the spring, flowering in July and August, and ripening abundance of seed in early autumn. Nothing more is necessary than to gather it before it begins to scatter, and to lay it on a cloth to become perfectly dry, before thrashing.

CAPSICUM.

Supposed either from Κάπτω, mordeo, *to bite; or from* capsa, *a chest.*

CAPSICUM ANNUUM.—CAPSICUM.

VARIETIES.

Of this there are five varieties.

1. Long-podded.
2. Heart-shaped.
3. Short-podded.
4. Angular-podded.
5. Round short-podded.

CAPSICUM CERASIFORME.—CAPSICUM.

Of this there are three varieties.

1. Cherry-shaped.
2. Bell-shaped, or Ox-heart.
3. Yellow-podded.

SOIL AND SITUATION.

The soil best suited for them is a rich, moist, mouldy loam, rather inclining to lightness than tenacity. They must have the shelter of a reed fence or wall, but fully open on the southward to the sun, consequently they are generally placed within the enclosure erected for the hotbed department.

TIME AND MODE OF SOWING.

They are propagated by seed, which must be sown towards the end of March, or beginning of April, in a hotbed of moderate size, with the shelter of a frame, but in default of a stove, hotbed, or frame, they may be raised under hand-glasses on a warm border; the sowing, however, being deferred until settled warm weather in May. The seed must be covered a quarter of an inch deep with mould. When the plants have attained six leaves, in about a month after sowing, they must be thinned to four inches apart, and those removed planted also in a moderate hotbed at a similar distance, being shaded from the meridian sun, and moderately watered until they have taken root. During the whole of their continuance beneath a frame, air must be admitted as freely as is possibly allowable, to prevent their being drawn and weakened; and as May advances, they must be accustomed gradually to an uncovered situation, by lengthened

absence of the glasses during the day, and by degrees leaving them open of an evening; this prepares them for their final removal, at the close of that month, or early in June. Those raised in a border beneath hand-glasses, must also be thinned as directed above, and those removed planted in a similar situation, or, in default of hand-glasses, beneath a paper frame or matting. The same may be adopted for the plants from the hotbeds, if all other conveniences are wanting.

When planted out finally, they are to be set two feet asunder; screened from the sun, and watered every other evening until they have taken root. The watering may be continued occasionally in dry weather, throughout their growth, which greatly improves their vigour, and the fineness of the fruit.

They flower during July or beginning of August, and the pods are ready to be gathered for pickling at the close of this last month, or early in September.

TO OBTAIN SEED.

For the production of seed, a plant bearing some of the forwardest and finest fruit, of each variety, and grown as far apart as may be, must be preserved, that it may be ripe before the frosts commence, the first of which usually kills the plants. When completely ripe, the pods are cut and hung up in the sun, or in a warm room, until completely dry, in which state they are kept until the seed is wanted for sowing.

CARUM.

CARUM CARUI.—CARRAWAY.

It is now chiefly cultivated for its seeds, which are used in confectionary and medicinal preparations;

but its root was formerly much esteemed when boiled, and it is not easy to account for it falling into disuse.

SOIL AND SITUATION.

It delights in a deep, rich, moist loam. The ground for this, as well as other deep-rooting plants, is advantageously dug two spades deep*. An open situation is most suitable to it; but in extensive orchards, where the trees are far apart, it may be grown with success.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown in March or April, either broadcast and raked in, or in drills six inches apart; in either case being performed thin, and buried about half an inch deep. When well distinguishable, the plants must be thinned to six inches apart, and carefully hoed. The hoeing must be several times repeated in the early stages of their growth, to extirpate the weeds which at a later period cannot be conveniently got at. The plants flower in June, and ripen their seed at the close of summer.

CICHORIUM.

Pliny informs us that this name was derived by the Greeks from the Egyptians.

CICHORIUM ENDIVIA.—ENDIVE.

VARIETIES.

There are three varieties. The Green-curled, which is the only one cultivated for the main crops, as it

* See Beta, p. 95.

best endures wet and cold; the White-curled, chiefly grown for summer and autumn: the Broad-leaved or Batavian, is preferred for soups and stews, but is seldom used for salads.

SOIL AND SITUATION.

Endive delights in a light, dry, but rich soil, dug deep, as well for the free admission of its tap root, as to serve as a drain for any superabundant moisture; this should be especially attended to for the winter standing crops; for which, likewise, if the soil or substrata is retentive, it is best to form an artificial bed by laying a foot in depth of mould on a bed of brickbats, stones, &c., as excessive moisture, in conjunction with excessive cold, is in general fatal to this plant. The situation should be open, and free from the influence of trees.

TIME AND MODE OF SOWING.

It is propagated by seed, which for a first crop may be sown about the end of April, to be repeated in May, but only in small portions, as those which are raised before June soon advance to seed. Towards the middle of this month, the first main crop may be inserted; to be continued in the course of July, and lastly early in August; and in this month the main plantation is made. The seed is sown broadcast, thin, and raked in about half an inch below the surface. The plants speedily make their appearance; when an inch in height, they should be thinned to three or four inches apart: those taken away are too small to be of any service if pricked out. The bed must be kept clear of weeds from the first appearance of the plants, until they are removed; to promote their arrival at a fit size for performing this operation, water should be given occasionally in dry weather.

When the larger seedlings have been transplanted, the smaller ones which remain may be cleared of weeds, and have a gentle watering; by which treatment, in twelve or fourteen days, they will have attained a sufficient size to afford a second successional crop; and by a repetition of this management, in general, a third. The plants are generally fit for transplanting when of a month's growth in the seed bed; but a more certain criterion is, that when of five or six inches height, they are of the most favourable size.

PLANTING.

They must be set in rows twelve or fifteen inches apart each way; the Batavian requires the greatest space. Some gardeners recommend them to be set in trenches or drills, three or four inches deep; this mode is not detrimental in summer and dry weather; but in winter, when every precaution is to be adopted for the prevention of decay, it is always injurious.—Water must be given moderately every evening, until the plants are established, after which it is not at all requisite, except in excessive and protracted drought. If the plants are of a larger growth than is specified above, it is an advantageous practice to cut off the tips of the leaves before planting, as this checks them, and prevents, in a great measure, their premature advance to seed. Those which are left in the seed-bed, if the soil is at all favourable, in general attain a finer growth than those that have been moved. In November some plants that have attained nearly their full size, may be removed to the south side of a sloping bank of dry light earth, raised one or two feet behind, to be protected by frames, mats, or thick coverings of litter, during severe and very wet weather; but to be carefully uncovered during mild dry days. The plants, in this instance, are not required

to be farther apart than six or eight inches. This plan may be followed in open days during December and January, by which means a constant supply may be obtained. Instead of being planted in the above manner on a terrace, it is sometimes practised to take the plants on a dry day, and the leaves being tied together, to lay them horizontally in the earth, down to the tip of the leaves; this accelerates the blanching, but otherwise is far more subject to failure.

As the number necessary for a family is but small, but few should be planted at a time.

BLANCHING.

About three months elapse between the time of sowing and the fitness of the plants for blanching. This operation, if conducted properly, will be completed in from ten to fourteen days in summer, or in three or four weeks in winter. In hot weather the blanching is completed in half the time that is required, if the season is cold. To blanch the plants, it is the most common practice to tie their leaves together; to place tiles or pieces of board upon them; or to cover them with garden pots; whilst some recommend their leaves to be tied together, and then to be covered up to their tips with mould, making it rise to an apex, so as to throw off excessive rains. All these methods succeed in dry seasons, but in wet ones the plants treated according to any of the plans are very apt to decay. The one which succeeds best in all seasons is to fold the leaves round the heart as much as possible in their natural position, and being tied together with a shred of bass mat, covered up entirely with coal ashes in the form of a cone, the surface being rendered firm and smooth with the trowel. Sand will do; but ashes are equally unretentive of moisture, whilst they are much superior in

absorbing heat, which is so beneficial in the hastening of the process. If the simple mode of drawing the leaves together is adopted to effect this etiolation, they must be tied very close, and in a week after the first tying, a second ligature must be passed round the middle of the plant, to prevent the heart leaves bursting out. A dry afternoon, when the plants are entirely free from moisture, should be selected, whichever mode is adopted for this concluding operation.

TO OBTAIN SEED.

For the production of seed the finest and soundest plants should be selected, of the last plantation; and which most agree with the characteristics of the respective varieties. For a small family, three or four plants of each variety will produce sufficient. These should be taken in March and planted beneath a south fence, about a foot from it, and 18 inches apart. As the flower stems advance, they should be fastened to stakes, or if they are placed beneath palings, the supporting string can be nailed to them. They must be kept clear of weeds. In July the seed will begin to ripen; and here it must be observed, that each lateral branch is to be gathered, as the seed upon it ripens, for if none are gathered until the whole plant is changing colour, the first ripened and best seed will have scattered and be lost, so wide is the difference of time between the several branches of the same plant ripening their seed. Each branch must be laid, as it is cut, upon a cloth in the sun, and when perfectly dry, the seed beaten out, cleansed, and stored. Endive seed will vegetate after being kept five or six years*.

* L'Quintin's Comp. Gard., vol. ii. p. 309.

CICHORIUM INTYBUS.—SUCCORY, CHICORY, OR WILD ENDIVE.

Although this hardy perennial plant is much used on the Continent in salads, yet it has never been employed to any extent for that purpose in Britain.

SOIL AND SITUATION.

Like Endive, for the main crops it requires a rich light soil, and for the earlier sowings a moister one, in every instance having an open situation allotted to it.

TIME AND MODE OF SOWING.

It is propagated by seed, which must be sown annually; for although it is a perennial, yet after being cut from two or three times, the radical leaves become bitter, and worthless. Mr. Oldaker says, it should be sown at the end of June, or early in July; but L'Quintinyes recommends it to be performed in the beginning of March; and it may be, doubtless, performed for successional crops, between the two periods mentioned by the above writers, in the same manner as endive, and also like that salad herb in small portions at a time, the earliest sowings being very liable to run to seed. It is sown broadcast, moderately thick, in the same manner as endive, the directions for cultivating which are equally applicable in every other particular.

CULTIVATION.

When the plants begin to cover the ground, they are thinned to nine inches apart; and those removed planted out at similar distances. They require to be kept very clear of weeds; and if the leaves grow very

luxuriant, and shade the roots much, they must be cut off within an inch of the ground. Those grown from sowings antecedent to June, when of nearly full growth, which they arrive at in about four months from the insertion of the seed, must have all their leaves trimmed away, so as not to injure their hearts, and then covered over thick with sand, ashes, or long litter. By this treatment, those fresh leaves which are produced become etiolated and crisp, losing all their bitterness. Those which arise from the sowings of June and July, must, at the end of September, or early in October, be raised, and planted very close, by the dibble, in pots or portable boxes, having their leaves trimmed as before directed, and their roots shortened, previous to planting. Water must be given moderately in dry weather, until they are established, and shelter if frosts occur by a light covering of litter. When well rooted they may be removed into the cellar, or other place, where the light can be completely excluded from them, to blanch for use as wanted, which change will be effected in six or seven days. Succory will bear a temperature of 60°, but thrives better in a rather lower one.

If the roots are vigorous, they will bear cutting from two or three times, after which they are unproductive.

TO OBTAIN SEED.

For the production of seed, a few plants must be left in the open ground of the June sowing; they bear the severity of winter without protection, and shoot up in the spring, running to seed about May*.

* Trans. Hort. Soc. Lond., vol. iii. p. 138.

COCHLEARIA.

From the form of the leaves of the Horse Radish, which, being rather hollow, resemble an old-fashioned spoon, cochlear.

COCHLEARIA ARMORACIA.—HORSE RADISH.

SOIL AND SITUATION.

The Horse Radish delights in a deep, mouldy, rich soil, kept as much as possible in a moderate but regular degree of moistness; hence the banks of a ditch, or other place which has a constant supply of water, is a most eligible situation for the beds, so that they do not lie so low as to have it in excess. If the soil is poor, the roots never attain any considerable size; and the same effect is produced if grown in a shady place, or beneath the drip of trees.

MANURES.

Should the ground require to be artificially enriched, Mr. J. Knight recommends leaf mould, or other thoroughly decayed vegetable substance, to be dug in to the depth at which the sets are intended to be planted. If cow or horse-dung are from necessity employed, it should be in a highly putrescent state*.

TIME AND MODE OF PROPAGATION.

Horse Radish flowers in June, but in this climate seldom perfects its seed; consequently it is propagated by sets, which are provided by cutting the main root

* Trans. Hort. Soc. Lond., vol. i. p. 209.

and offsets into lengths of two inches. The tops or crowns of the roots form the best; those taken from the centre never becoming so soon fit for use, or of so fine a growth. If the latter is, however, unavoidably employed, each set should have at least two eyes; for without one, they refuse to vegetate at all. Mr. J. Knight recommends, for the obtaining a supply of the crowns, any inferior piece of ground to be planted with sets, six inches apart and six deep; those will furnish from one to five tops each, and these may be collected for several successive years with little more trouble than keeping them clear of weeds.

It may be planted from the close of January until the same period in March; but the best times are in October and February; the first for dry soils, the latter season for moist ones.

The sets must be inserted in rows eighteen inches apart each way. The ground should be trenched between two and three feet deep, the cuttings being placed along the bottom of the trench, and the mould turned from the next one over them, or inserted to a similar depth by a long, blunt-pointed dibble. They should be placed in their natural position, which has considerable influence over the forwardness of their growth. When the planting is completed, the surface should be raked level and kept clear of weeds, until the plants are of such size as to render it unnecessary. It is of great benefit if the mould lies as light as possible over the sets; therefore treading on the beds should be carefully avoided. They speedily take root, and send up long straight shoots, which make their appearance in May or June, or even earlier if they were planted in autumn. The only cultivation required is to keep them free of weeds, and, as the leaves decay in autumn, to have them carefully removed; the ground being also hoed and raked over

at the same season, which may be repeated in the following spring, before they begin to vegetate; at which time Mr. J. Knight likewise recommends eighteen inches depth of mould to be laid regularly and lightly over the bed. In the succeeding autumn they merely require to be hoed as before, and may be taken up as wanted. By having three beds devoted to this root, one will always be lying fallow and improving, of which period likewise advantage should be taken to apply any requisite manure. If, when of advanced growth, the plants throw out suckers, these should be carefully removed during the summer as they appear. In September or October of the second year, as before stated, the roots may be taken up, and in November a sufficient quantity should be raised to preserve in sand for winter supply.

TAKING UP.

To take them up, a trench is dug along the outside row, down to the bottom of the upright roots, which by some persons, when the bed is continued in one place, are cut off level to the original stool, and the earth from the next row is then turned over them to the requisite depth, and so in rotation to the end of the plantation. By this mode a bed will continue in perfection for five or six years, after which a fresh plantation is usually necessary. But the best practice is to take the crop up entirely, and to form a plantation annually; for it not only causes the roots to be finer, but also affords the opportunity of changing the site. If this mode is followed, care must be taken to raise every lateral root, for almost the smallest of them will vegetate if left in the ground*.

* Trans. Hort. Soc. Lond., vol. i. p. 209.

COCHLEARIA OFFICINALIS.—SCURVY GRASS.

SOIL AND SITUATION.

It flourishes most in a sandy moist soil, but will succeed in almost any other, especially if abounding in moisture. The situation must always be as open as possible.

TIME AND MODE OF SOWING.

It is propagated by seed, which should be sown as soon as it is ripe in July or June, for if kept from the ground until the spring, they will entirely lose their vegetative power, or produce plants weak and unproductive. The sowing is performed in drills eight inches apart, and half an inch deep.

CULTIVATION.

As soon as the plants are perfectly distinguishable, they must be thinned to eight inches asunder, and those removed may be transplanted to a bed at similar distances; giving water at the time and frequently afterwards, until fully established. They require no other attention than to be kept free from weeds.

The leaves are fit to gather during the following spring.

TO OBTAIN SEED.

For the production of seed, a few plants must be left ungathered from in the spring. They will run up to flower about May, and perfect their seed in the course of the two following months.

CORIANDRUM.

From κορις, a bug. *The fresh leaves when bruised, emitting an odour very similar to that of this vermin.*

CORIANDRUM SATIVUM.—CORIANDER.

SOIL AND SITUATION.

It thrives best in a moderately rich but sandy loam: excessive moisture is equally inimical to it, as the want of a regular supply. It must have an open and rather sheltered situation.

TIME AND MODE OF SOWING.

It is propagated by seed, which, if it is required early, must be sown during February, in a warm border, or moderate hotbed, in either situation with the protection of a frame. This may be repeated at the close of March. Afterwards small crops may be successionally inserted every month in an open bed or border until September, in which month, and October, if required for winter's supply, final crops must be sown under a frame, as in February. The summer sowings should always be of small extent, as the plants at that season are very apt to run.

The sowings are generally performed in drills eight inches apart and half an inch deep; the plants to remain where sown. The only cultivation required is to thin them to four inches distance, and to have them kept clear of weeds throughout their growth.

TO OBTAIN SEED.

For the production of seed, some plants of the early spring sowings must be left ungathered from at about eight inches apart each way; they will perfect their seed in early autumn, being in flower during June.

CRAMBE.

From κραμβος, dry, *because it frequents shingly, dry shores; or from* κοραμβλη, *on account of its being supposed to render the eyesight dim.*

CRAMBE MARITIMA.—SEA CALE, COLE, OR COLEWORT.

SOIL AND SITUATION.

A LIGHT, moderately rich soil, on a dry substratum, suits it best; though in any dry soil it will succeed. A bed may be composed for it of one-half drift sand, one-third rich loam, and one-third small gravel road stuff or coal ashes: if the loam is poor, a little well-rotted dung or decayed leaves being added. The soil must especially be deep, so that the roots can penetrate without being immersed in water, which invariably causes their decay. Mr. T. Barton, of Bothwell Castle, has even found it succeed well on a pretty strong loam that had a loose bottom *. The depth should not be less than two and a half feet; and if not so naturally, worked to it by trenching. If at all tenacious, this opportunity may be taken to mix with it drift or sea sand, so as to reduce it to a mouldy texture. If wet it must be drained, so that water never shall stand within three feet of the surface. If poor, well putrified dung must be added; but decayed leaves are preferable †, and sea weed still more so. These precautions must all be particularly attended to, for upon the due richness and dryness of the soil not only depends the luxuriance and delicate

* Mem. Caled. Hort. Soc., vol. ii. p. 100.

† Trans. Hort. Soc. Lond., vol. i. p. 17.

flavour of the plants, but their very existence. Common salt, as might be anticipated, is found to be a very beneficial application, either applied dry, at the close of autumn, in the proportion of twenty or thirty bushels per acre, or by occasional waterings with a solution, containing four or five ounces in the gallon, round every stool during the summer. As regards the situation, it cannot be too open and free from trees.

TIME AND MODES OF PROPAGATION.

It is propagated both from seed and slips of the root: the first is by far the best mode, for although from slips it may be obtained with greater certainty, yet the plants arising from seed are the strongest and longest lived; whilst the failure of seed, which is sometimes complained of, mostly arises from its being old, buried too deep, or some other extraneous cause. The seed may be inserted from October to the commencement of April, but the best time for inserting it is during January or February. It is by much the best mode to leave the plants where raised, and with that intent, to guard against failure, inserting the seed in patches of six or twelve seeds, each six inches apart, and the patches two feet asunder. If, however, they are intended for transplanting, the seed may be sown in drills twelve inches asunder; in either case it must not be buried more than two inches below the surface; and it is a good practice, previous to inserting it, to bruise the outer coat of the seed, without injuring its vegetating power, as by this treatment the germination is accelerated. The plants will in general make their appearance in four or five months, never sooner than six weeks, but on the other hand, the seed will sometimes remain twelve months before it vegetates.

The best time for increasing it by slips, is in

March. Rooted offsets may be detached from established plants; or their roots, which have attained the thickness of the third finger, be cut into lengths, each having at least two eyes. To plant the offsets requires no particular direction:—the cuttings must be inserted in an upright position two or three inches beneath the surface. It is best to plant two together, to obviate the danger of failure, at two feet apart, to remain. Some persons, from a desire to save a year, recommend yearling plants to be obtained and inserted in February or March; but as the shoots ought not to be cut for use the first season after planting, the object is not attained, for seedlings may be cut from the second year.

Whatever mode of propagation is adopted, the beds should be laid out three feet wide, and a two-feet alley between every two, in preference to the plan sometimes recommended, of planting three rows in beds seven feet wide, for in such the soil must be consolidated by the feet during the necessary grades of cultivation.

If the months of June and July prove dry, the beds should be plentifully watered. The seedlings require no other attention during the first summer, than to be kept free from weeds, and if they come up too numerous, to be thinned to five or six in each patch. When their leaves have decayed, and been cleared away about November, they must be earthed over an inch or two with dry mould from the alleys, and over this about six inches depth of long litter be spread, and thus left to stand the winter. In the following spring the litter is to be raked off, and a little of the most rotten dug into the alleys. When the plants have perfectly made their appearance, they must be thinned, leaving the strongest plant, or, as Mr. Maher recommends, the three strongest, at each

patch; those removed being transplanted at similar distances if required; but it must be remarked that those transplanted never attain so fine a growth, or are so long lived. In this second winter, the earthing must be increased to five or six inches deep over the crowns, and the covering of litter performed as before. In the third spring, the litter being removed, and some dug into the alleys, as before, about an inch depth of drift sand or coal ashes must be spread regularly over the surface. The sprouts may now be bleached and cut for use, for if this is commenced earlier, the stools are rendered much less productive, and much shorter lived. In November, or as soon as the leaves are decayed, the beds being cleared of them, the coating of sand or ashes removed, and gently stirred with the asparagus fork, they must be covered with a mixture of three parts earth from the alleys, and one part of thoroughly decayed leaves, to the depth of three or four inches. The major part of this is to be removed in the following spring, the beds forked, and the covering of sand renewed, this routine of cultivation continuing during the existence of the beds.

The above course is the one also pursued if the plants are raised from offsets or cuttings, as it is by much the best practice not to commence cutting until they are two years old.

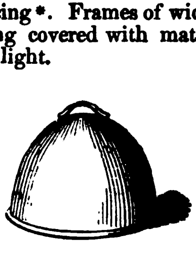
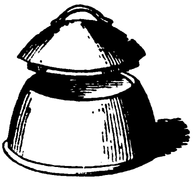
BLANCHING.

Blanching, as before observed, may commence the second spring after sowing. The most simple mode is that originally adopted, namely, to cover over each stool sand or ashes to the depth of about a foot; the shoots in their passage through it, being excluded from the light, are effectually bleached. Sir G. S. Mackenzie, Bart. scatters dry clean straw loosely over the plants,

to effect the same purpose*; but this mode is troublesome, inasmuch as that the straw must be changed as often as it becomes wet and heavy. The same objection I should conceive is applicable to the plan of Mr. T. Barton, of Bothwell, though he does not give any directions for a renewal of the covering under similar circumstances. He covers the bed entirely with the dry leaves as they are collected in autumn to a depth of from five to twelve inches, the first being the quantity allotted to the youngest, the latter to the oldest plants; over the leaves a slight covering of long dung is laid, just sufficient to keep them from being scattered by the winds. This covering remains until the cutting ceases in the spring, when it is entirely removed and the bed dug over. The shoots raise the covering so as to indicate when they are in a fit state for cutting, and thus obviate the necessity of removing more of it than is immediately over the plant; it is likewise stated, that no unpleasant taste is communicated by the leaves†. But pots are by much to be preferred to any of these coverings. Common flower-pots of large dimensions may be employed, care being taken to stop the hole at the bottom with a piece of tile and clay, so as to exclude every ray of light; but those suggested by Mr. Maher, and represented in the following page, are generally adopted. They are of earthenware, twelve or eighteen inches in diameter, and twelve high. Mr. Sabine improved upon them by making the top moveable, (No. 2,) which prevents the trouble arising from the escape of the spreading shoots, or the entire removal of the dung at the time of

* Mem. Caled. Hort. Soc., vol. i. p. 313.
† Ibid. vol. ii. p. 99.

forcing *. Frames of wicker are sometimes employed, being covered with mats more perfectly to exclude the light.

Previous to covering the stools with the pots, &c. the manure laid on in the winter must be removed; and the operation should commence at the close of February, or at least a month before the shoots usually appear, as the shelter of the pots assists materially in bringing them forward. In four or six weeks after covering the plants should be examined, and as soon as they appear three or four inches high, they may be cut; for if none are taken until they attain a fuller growth, the crop comes in too much at once. In order to prolong the season of production, Mr. Barton recommends plants to be raised annually, so that every year a cutting may be had from a yearling crop, which come in much later, and consequently succeed in production the old established roots. The shoots should be cut whilst young and crisp, not exceeding five or six inches in height; the section to be made just within the ground, but not so as to injure the crown of the root. Slipping off the stalks is said to be much preferable to cutting. The plants may be gathered from until the flower begins to form,

* Trans. Hort. Soc. Lond., vol. i. p. 18.

when all covering must be removed. If, when arrived at the state in which brocoli is usually cut, it is employed as that vegetable, it will be found an excellent substitute *. Some persons, however, recommend the same plant to be cut from only once; if we wish to prolong the duration of our beds, which must be renewed as soon as the stools appear declining, and produce weakly shoots, this practice of course is preferable; so studious, indeed, are they to prevent overcutting, that it is recommended to have such an extent of beds, that one-half may be allowed alternately to lay *fallow*, or to be cut from only every other year †. When the cutting ceases, all covering must be removed, and the plants be allowed to grow at liberty.

TO OBTAIN SEED.

For producing seed, a stool, which has not been cut from, or even covered at all for blanching, must be allowed to run in spring. It flowers about June, and produces abundance of seed on every stem, which ripens about the close of July, or early in August.

FORCING.

To force sea cale, some established plants, at the end of October or early in November, being trimmed as directed above at that season, and the bed covered with a mixture of moderately sifted light earth, and sand or coal ashes, two or three inches deep, each stool must be covered with a pot, set down close, to keep out the steam of the dung; or, as Sir G. Mackenzie observes, bricks or planks may be placed to the height of eight or ten inches on each

* Curtis on the Crambe Maritima, new edit. p. 23.

† Mem. Caled. Hort. Soc., vol. i. p. 315.

side of the row to be forced, and covered with cross spars, having a space of about an inch between them *. But this mode is by no means so eligible as the first. The dung employed must be well tempered and mixed for three weeks before it is required, or for four, if mingled with leaves, otherwise the heat is violent, but transient. When thus prepared, each pot is covered ten inches thick all round, and eight inches at the top. The heat must be constantly observed; if it sinks below 50°, more hot dung must be applied; if above 60°, some of the covering should be removed. Unless the weather is very severe, it is seldom necessary to renew the heat by fresh linings; when the thermometer indicates the necessity, a part only of the exhausted should be taken away, and the remainder mixed with that newly applied. In three or four weeks from being first covered, the shoots will be fit for cutting, and they will continue to produce at intervals for two or three months, or until the natural crops come in. To have a succession, some should be covered with mulch, or litter that is little else than straw; this, by sheltering the plants from cold, will cause them to be forwarder than the natural ground ones, though not so forward as those under the hot dung; and by this means it may be had in perfection from Christmas to Whitsuntide.

Mr. W. Gibbs, of Inverness, and Mr. Barton, before mentioned, recommend it to be forced in a hot-bed, as asparagus. When the heat moderates, a little light mould being put on, three or four year old plants, which have been raised with as little injury as possible to the roots, are to be inserted close together, and covered with as much earth as is used for cucumbers. The glasses must be covered close with double matting to exclude the light, and additional

* Mem. Caled. Hort. Soc., vol. i. p. 315.

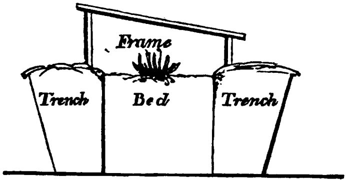
covering afforded during severe weather. Mr. Barton, however, when the danger of overheating is past, removes the light, and puts on leaves to the depth of four or five inches, adding more as the heat declines, until the frame is nearly full. Sea cale, thus forced, will be fit for cutting in about three weeks. Instead of frames and glasses, any construction of boards and litter that will exclude the light, would undoubtedly answer as well*. This mode of forcing is greatly superior to that of whelming hot dung over pots, &c. The saving, observes Mr. Barton, in labour and dung is obvious; added to which, the difficulty in the old mode of keeping up a regularity of temperature is obviated. A common melon frame will contain as many as are capable of being produced in two drills of twenty yards each, and with only one-third the quantity of dung. To keep up a regular succession until the natural ground crop arrives, the same gentleman observes, two three-light frames will be sufficient for a large family; the first prepared about the beginning of November, and the second about the last week in December. Mr. A. Melross, of Ardgowan, inserts the plants along the back of the flue in his vinery; the pots being put over them, and the heat of the vinery regularly kept up, shoots may be cut in a fortnight. Twelve covers will supply a family, and a regular succession kept up until the open ground crop is in production, by taking away the roots as soon as cut from, and planting others†.

Mr. T. Baldwin, of Ragley, also recommends a plan, which in a manner is a combination of the other two, and certainly obviates an objection to the frame forcing; namely, the destruction of the plants, whilst at the same time it is nearly as economical in the consumption of dung. On each side of a

* Mem. Caled. Hort. Soc., vol. i. p. 389; vol. ii. p. 100.

† Mem. Caled. Hort. Soc., vol. iii. p. 164.

three-foot bed, a trench is to be dug two feet deep, the side of it next the bed being perpendicular, but the outer side sloping, so as to make it eighteen inches wide at the bottom, but two and a half feet at the top. These trenches being filled with fermenting dung, which of course may be renewed if ever found necessary, and frames put over the plants, the light is to be completely excluded by boards, matting, &c. The accompanying sketch represents a section of the construction *.



Unlike the generality of vegetables, the shoots of forced sea cale are always more crisp and delicate than those produced naturally. Those plants will not do for forcing a second time which have been forced in frames; consequently a small bed should be sown every year for this purpose, so that a succession of plants may be annually had, they not being used until three years old. Sometimes a plant will send up a flower stalk; this must be immediately cut away, it will then be as productive as the others. But those plants which are forced by whelming dung over the pots, are not much detrimented for the natural ground production of the succeeding year. When, therefore, they have done producing, all covering must be removed, and the ground dressed. Mr. Nicol knew an instance of the same plants being forced for seven years, and producing as healthy

* Trans. Hort. Soc. Lond., vol. iv. p. 64.

shoots as if only forced every second year*; but to force the same plants but seldom is the best practice.

CUCUMIS.

From κικυος *or* σικυος. *Varro says, "Cucumeres dicuntur a curvere, ut curvimere dicti."*

CUCUMIS SATIVUS.—CUCUMBER.

The following are the chief varieties;—

1. Early short green prickly.
2. Early long green prickly.
3. Most long green prickly.
4. Early green cluster.
5. White Dutch prickly.
6. Long smooth green Turkey.
7. Large smooth green Roman.
8. Flanegan's.
9. Russian.
10. White Turkey.
11. Nepal.
12. Fluted. From China.
13. The Snake.

The early short prickly is about four inches long, and is often preferred for the first crop as being a very plentiful bearer, quick in coming into production, and the hardiest of all the varieties. The early long prickly is about seven inches long; it is as hardy, abundantly bearing variety, but not quick in coming into production. It is generally grown for main crops. The longest prickly is about nine or ten inches in length—it is a hardy, good bearer. There is a white sub-variety. The early green cluster is a very early bearer. Its fruit is about six

* Curtis on the Crambe Maritma, new ed., p. 33.

inches long. It is chiefly characterised by its fruit growing in clusters. The whole plant grows compact, and is well suited for hand-glass crops. The white Dutch prickly is about six inches long—it has an agreeable flavour, though differing from most of the others. It comes quickly into bearing.

The other varieties are slow in coming into production, and are chiefly remarkable for their great size. The Nepal often weighs twelve pounds, being occasionally eight inches in diameter and seventeen in length. It is a native of Calcutta. The snake cucumber is very small in diameter, but attains the length, it is said, of twelve or more feet. A friend tells me he has seen it more than half that size.

It is to be presumed, before entering upon a detail of the necessary cultivation of this vegetable, that nearly all the requisite management of the hotbed has been stated, when considering this source of artificial heat; I shall therefore confine my attention simply to the management of the plants.

SOIL AND SITUATION.

A fresh loam, rather inclining to lightness than tenacity, as the top-spit of a pasture, is, perhaps, as fine a soil as can be employed for the cucumber. It will succeed in any open soil of the garden, for the hand-glass and natural ground crops. Some gardeners, however, prefer a compound mould; the one most generally approved, is composed of one-third top-spit earth, from a rich upland pasture, one-third vegetable mould, one-sixth well decomposed horse-dung, and one-sixth drift or sea-sand. The situation must be as open and as free from the influence of trees as possible; but for the open ground crops that are in blossom at the very hottest time of the year, it is of great advantage to have them situated so as to be sheltered from the sun during the meridian.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown for the earliest crops in October, November, and December, and two or three times a month during January and following months, until the middle of May. All these sowings should be plentiful, especially the earliest ones, as failures are in these sowings most likely to occur.

The hotbed for seedlings must be moderate, and a single one or two-light frame will be quite sufficient, if dedicated to their cultivation. The mould need not be more than five or six inches deep. The seed is best sown four together, in small pots, and plunged in the earth of the bed; but whether here or in the mould, it must not be buried more than half an inch deep. Two or three days after sowing, or when the seminal leaves are half an inch in breadth, those in the mould of the bed must be pricked three together into small pots, quite down to their leaves in the earth, which should be brought to the temperature of the bed before this removal, by being set in it for a day or two previously; those seedlings that have been raised in pots must likewise be thinned to three in each. They must remain plunged in the hotbed until their rough leaves have acquired a breadth of two or three inches, when they are fit for ridging out finally.

During this first stage of growth, great care must be taken that air is admitted every day as freely as contingent circumstances will admit, as also at night, if the degree of heat and steam threatens to be too powerful. It must never be neglected to cover the glasses at night, apportioning the covering to the temperature of the air and bed. The heat should not exceed 70° in the hottest day, or sink below 58° during the coldest night. If the heat declines, coat-

ings of hot dung are to be applied in succession to the back, front, and sides. As the mould appears dry, moderate waterings must be given, care being taken not to wet the leaves. The best time for applying it is between ten and two of a mild day, the glasses being closed for an hour or two after performing it. The temperature of the water must be between 65° and 58°. The interior of the glass should be frequently wiped, to prevent the condensed steam dropping upon the plants, which is very injurious to them. If the bed attains a sudden violent heat, the necessary precautions to prevent the roots of the plants being injured or *scalded* must be adopted.

It is a material advantage, if, previous to planting finally, the plants be turned into pots a few sizes larger without at all disturbing the roots, and plunged into a hot-bed for a month longer; the same attention being paid them as before.

The second stage of cultivation is planting them out into hot-beds for final production. The hot-bed for their reception must be of the largest size, as being required to afford a higher and longer continued warmth through the coldest periods of the year. When the mould is put on, it is at first to be spread only two or three inches deep, but under the centre of each light a hillock must be constructed eight or ten inches deep and a foot in diameter. The moulding should be performed at least four or five days before planting, at which time the earth must be examined; if it be of a white colour and caked, or as it is technically termed *burnt*, it must be renewed, for the plants will not thrive in it, and holes bored in the bed to give vent to the steam. The mould of the hillocks being well stirred, the plants must be turned out of the pots without disturbing the ball of earth, and one containing three plants inserted in each. A little water, previously heated to the requisite temperature, must

be given, and the glasses kept perfectly close until the next morning. Any plants not in pots must be moved by the trowel with as much earth pertaining to their roots as possible. The shade of a mat is always requisite during the meridian of bright days, until the plants are well established. They must be pressed gradually away from each other until at least eight inches apart; nothing can be more erroneous than to allow them to proceed with the stems nearly touching. When well taken root, earth must be added regularly over the bed until it is level with the tops of the mounds; for if there is not a sufficient depth of soil, the leaves will always droop during hot days, unless they are shaded, or more water given them than is proper.

An important operation for the obtaining early fruit, but by no means so necessary for later crops, is the first pruning, or, as it is termed, *stopping* the plant, that is, nipping off the top of the first advancing runner, which is to be done as soon as the plant has attained four rough leaves; this prevents its attaining a straggling growth, and compels it at once to emit laterals, which are the fruitful branches. When they begin to run, the shoots must be trained and pegged down at regular distances, which not only prevents their rubbing against the glass, but also becoming entangled with each other. Never more than two or three main branches should be left to each plant, all others to be removed as they appear; if more are left, it causes the whole to be weak, and entirely prevents the due exposure of the foliage to the sun. The greatest care is necessary in regulating the temperature; it must never be allowed to decline below 70° or rise above 80°. As it decreases, coatings of hot dung must be applied to the sides, and the covering increased. The temperature of the bed, as

well as of the exterior air, governs also the degree of freedom with which the air may be admitted. A constant renovation is effected by Dr. Hale's plan; but whenever it is allowable, the glasses should be raised. The best time for doing so is from ten to three o'clock.

It may be not misplaced to remark, that chilly, foggy days are even less propitious for admitting air, than severe frosty ones; during such it is best to keep the frames close, and to lessen the opening of the glasses in proportion as the air is cold or the beds declining, it never exceeding two inches under the most favourable circumstances. Water is usually required two or three times a week; it must be warmed, as before mentioned, previous to its application. It is recommended by Mr. Mills, gardener to Mrs. Dare, of Ilford, Essex, instead of watering in the inside of the frame, to do so plentifully round the sides, which causes a steam to rise, and affords a moisture much more genial to the plants than watering the mould *.

The last stage of growth includes the blossoming and production of fruit. The training must be regularly attended to, and all superabundance of shoots and leaves especially kept away. If the plants which have been once stopped have extended their runners to three joints without showing fruit, they must be again stopped. The impregnation of the fruit now requires continued attention: as soon as a female blossom, which is known by having fruit beneath the flower-cup, opens, or on the second morning at farthest, a fresh, full-expanded male flower is to be plucked with its footstalk pertaining

* Trans. Hort. Soc. Lond., vol. iii. p. 169.

to it, and the petal or flower cup being removed, the remaining central part or anther applied to the stigma of the female, which is similarly situated, and the fecundating dust discharged by gently twirling it between the finger and thumb. If possible, a fresh male blossom should be employed for every impregnation, and the operation performed in the early part of the day. An attention to this is only requisite to such plants as are in frames; those grown in the open air are always sufficiently impregnated by bees and other insects. If impregnation does not take place, the fruit never swells to more than half its natural size, nor perfects any seed, but generally drops immaturely. When the male flowers appear in clusters, they may be thinned moderately, with benefit, but it is almost needless to deprecate the erroneous practice sometimes recommended of plucking them off entirely. As the fruit advances, tiles, sand, or other material, must be placed beneath it, to preserve it from specking. The same precautions are necessary as regards the preservation of temperature, admission of air, &c., as in the second stage of the growth of the plants. Towards the conclusion of the first production, it is a good practice to renew the heat by adding eighteen inches of fermenting dung all round the bed, previous coatings being entirely removed, and to earth over it to the same depth as in the interior of the bed: this prevents the roots, when they have extended themselves to the sides of the bed, being dried by exposure to the air and sun. As the spring advances, the glasses may be often taken off during mild days, or even to admit a light, temperate rain; in June or July, according to the geniality of the season, they may be removed finally, and even before, the frames may be raised on bricks so as to allow the runners to spread at will.

For a middling-sized family, from four to eight lights are sufficient to afford a constant supply, and for a larger one, double those numbers. During mid-winter, ten or twelve weeks elapse between the time of sowing the seed and the fitness of the fruit for gathering; but as the more temperate seasons of the year advance, this period decreases gradually to eight and six. Between the time of impregnation and their full growth, from fifteen to twenty days usually elapse. Under favourable circumstances and management, the same vines will continue in production three or four months.

HAND-GLASS CROPS.

The first sowings for these crops must be in the last two weeks of March, to be repeated in the middle of April and May. The seed may be inserted in a moderate hotbed under hand-glasses, or in the upper side of one of the frames already in production, either in pots, as directed for the frame crops, or in the mould of the bed, to be pricked into similar situations, when of four or five days' growth, inserting only two plants, however, in each pot. They must remain in the hotbed until of about a month's growth, or until they have attained four rough leaves; being then stopped, as before directed, they are fit for ridging out finally.

The ridges may be founded on the surface, or in trenches a foot and a half deep; in either case forming them of well prepared hot dung, three or four feet wide and two and a half high, the length being governed by the number of hand-glasses, between each of which three and a half feet must be allowed. The earth is to be laid on eight inches thick; when this becomes warm, the plants may be inserted, two or at most three under each glass.

Watering, airing, covering, &c., must be conducted with all the precautions directed to be practised for the frame crops. The glasses should be kept on as long as possible, without detriment to the plants; to prolong the time the runners must be made to grow perpendicularly, and still further to protract their continuance, if the season is inclement, the glasses may be raised on bricks. When no longer capable of confinement the runners must be pegged down regularly, advantage being taken of a cool, cloudy day to perform it in; but the glasses even now may be continued over the centre of the planst until the close of May or early June with considerable advantage. Weeds must be carefully removed. Waterings should be performed as often as appears necessary.

If there is a scarcity of dung, in the last week of April or during May, circular holes may be dug two feet in diameter, one deep, and four apart. These being filled with hot dung, trod in moderately firm and earthed over about eight inches, are ready for either seeds or plants. With the shelter of the hand-glasses, they will be scarcely later in production than the regular ridges. In case of a deficiency of glasses, oiled-paper frames may be employed.

OPEN-GROUND CROPS.

The sowings for these crops must be performed at the close of May, or early in June. A rich south-west border, beneath a reed or other fence, is peculiarly favourable, as they then enjoy a genial warmth, without suffering from the meridian sun. The border being dug regularly over, and saucer-like hollows, about fifteen inches in diameter and one or two deep, formed five feet apart, the seed may sown six or eight

in each. Seed may also be sown beneath a hedge of similar aspect, and either trained to it, or bushy branches placed perpendicular: this is said greatly to improve their growth and flavour. If the weather is dry it is requisite to water the patches moderately two or three days after sowing. In four or five, if the season is genial, the plants will make their appearance, and until they have attained their rough leaves, should be guarded from the small birds, who will often destroy the whole crop by devouring the seminal leaves.

If the season is cold and unfavourable, plants may be raised in pots under a frame or hand-glasses, as directed for those crops; to be thence transplanted when of about a month's growth, or when the third rough leaf appears, into the open ground, shelter being afforded them during the night. Water must be given every two or three days, in proportion to the dryness of the season, applying it at this season of an afternoon or early in the morning. Only three or four plants may be allowed to grow together in a patch, and these pressed far apart. The training must be as carefully attended to as for the other crops, but stopping is seldom necessary, as the plants are seldom super-luxuriant. They will come into production in August and September.

In the early part of August, a small sowing may be made in a moderate hotbed, to be defended at night and during unfavourable weather with glasses, to produce late fruit in October.

TO OBTAIN SEED.

For the production of seed, to sow for the frame crops, some fruit must be left of the earliest forced production, as this is found to vegetate and produce fruit in much less time than that raised

under hand-glasses, from whence the seed for the open ground crops is usually obtained. The fruit that is left to produce seed, should grow near the root and upon the main stem; not more than one being left on a plant. They must remain as long as the seed can obtain any nourishment from the plant, which it does whilst the footstalk remains green; when this withers and the rind of the cucumber has attained its full yellow hue, they may be gathered and reared in the sun until they begin to decay. The seed then being scraped out into a vessel, allowed to remain for eight or ten days and frequently stirred, until the pulp attached to it is decayed, may be cleansed by frequent agitation in water. The refuse rises to the top and passes away with the supernatant liquid. Being thoroughly dried by exposure to the air for three or four days, it is then fit for storing. Seed three or four years old is found to be best for use, as it procures less luxuriant but more productive plants. If older, it is apt to have lost its power of vegetating.

PROPAGATION BY CUTTINGS.

Cuttings five or six inches in length taken from the tops of bearing branches of vigorous plants, about the end of September or early in October, planted in pots of rich mould, and plunged in a hotbed, or bark bed in a stove, will take root, if regularly watered, in less than a fortnight, and may then be planted in a hotbed for fruiting, which they will do as soon as the roots can support them, perfecting it before Christmas. They may thus be had in succession, and being propagated from year to year, are rendered, as it were, perennial. Mr. Mearns, gardener to W. Hanbury, Esq., near Leominster, always obtains his plants in this manner, and finds them less suc-

culent, and consequently less liable to damp off, or suffer from the low temperature to which they are liable to be exposed in severe seasons. His mode is somewhat novel. He puts four inches and a half of mould in pots nine inches deep, in which the cuttings are planted and watered, the tops of the pots being covered with flat pieces of glass, which answers the purpose of a hand light, whilst the sides of the pot afford a sufficient shade until the roots are formed*. In the same communication a very decisive experiment is narrated of the benefit afforded to this plant by the use of liquid manure, as recommended by Mr. Knight. When the plants have afforded their first crop, any small fruit must not be waited for, but the plants be cut back to the lowest shoot, the mould gently stirred, and a little fresh spread over the surface; the same attention must be paid them as before, when they will shoot afresh and produce a good crop.

CUCUMIS MELO.—MELON.

VARIETIES.

The varieties of the melon are numerous; yet few of them comparatively are worthy of cultivation. The larger varieties especially are deficient in flavour and richness. Mr. Knight says, that whoever is acquainted with the green-fleshed, and Salonica, or white-fleshed, will cultivate no other †.

The Cantalupes are varieties characterised by their rinds being universally covered with reticulations;

* Trans. Hort. Soc. Lond. vol. iv., p. 412.
† Mem. Caled. Hort. Soc., vol. ii. p. 263.

they, with the exception of the green, or oblong-ribbed, bear round fruit, more or less approaching a flattened spheroid. Their common name is derived from that of one of the country seats of the Pope, where they are much cultivated.

SOIL.

The soil, of course, is one of the principal points to be attended to; consequently it is one which has received considerable attention, and the formulæ for its preparation are proportionately numerous. I am perfectly confident that they are almost universally too rich in their composition; and entirely agree with Mr. Howison, of Crossburn House, Scotland, who considers mouldy earth from a pasture, *without any addition*, much better than a compost. From several years' experience, he finds the latter makes the vines luxuriant and the fruit large, but neither so abundant or high-flavoured *. If, however, the earth is to be obtained from a less fertile source, the practice of Mr. Flanagan, gardener to the Marquis of Northampton, may be advantageously adopted. He forms his soil of three parts rich loam, and one part well rotted dung †. The Dutch and German horticulturists form their composts one or two years before it is employed, of one-third hazel loam, one-third scouring of ditches, and one-third well-rotted dung. Miller recommends, as better suited to our climate, two-thirds of fresh gentle loam from the surface of an old rich pasture, and one-third rotten neat's-dung; whilst Abercrombie directs it to be formed of two-thirds of the top-spit from a sheep common, adding sharp sand, if the earth contains but little, until it is half silicious matter, one-sixth vege-

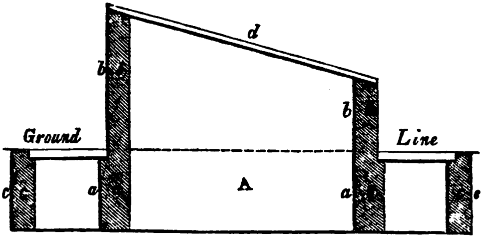
* Mem. Caled. Hort. Soc., vol. iii. p. 213.
† Trans. Hort. Soc. Lond., vol. iv. p. 188.

table mould, one-sixth well-decayed horse-dung, or, if the earth is not obtained from a pasture, sheep-dung.

In any case, even if simple earth is employed, it is of considerable advantage to have it procured two or three months at least before required; and being kept beneath a dry shed, to be frequently turned, pulverised, and the largest stones removed, no weeds being suffered to grow upon it, or to shed their seeds in its neighbourhood.

BED.

Although a common hotbed is generally used for this plant, yet a pit, as it is technically termed, is more economical, and by enabling a more regular temperature to be sustained, renders the fruit in greater perfection. The pit is a rectangular frame or bin, built of nine-inch brickwork, in preference to boards (which have to be renewed every five or six years, if employed), three feet high at the back, lessening to two in front, six or eight broad, and of any length required, but not less than ten feet. This is to contain the tanners' bark, leaves, or stable-dung employed, and inclosed by a glasscase of the necessary dimensions. Mr. Smith, gardener to A. Keith, Esq. of Ravelstone, N. B., has suggested a mode of building a pit, which renders the renewal of the heat in it easy, and, as the committee appointed to examine it report, is the means of considerable saving, compared with the common mode of forming an open bed. But the facility with which linings may be applied is its best feature; for if by any chance the heat failed, there was seldom any alternative, in the old pits, but to break them up. The accompanying sketch will at once show the form of the pit, and Mr. Smith's mode of applying the linings.



A is the pit, the sides of which *a a*, instead of being a continuous piece of brickwork, are merely rows of pillars, 6 feet apart; and the brickwork of the frame *b b* is supported by bars of iron, reaching from pillar to pillar. An outer wall, *c c*, is constructed at two and a half feet distance from the pillars on each side; thus two bins are formed, in which the linings are inserted, as is found necessary, and are kept close covered with thick boards*; *d* represents the lights, which thus are formed without any wooden frames. For other modes of constructing forcing-pits, *vide* p. 17. If a common hotbed is employed, fifteen barrow-loads of dung is the usual allowance to each light, which make it about six inches higher than is allowed for the cucumber bed of largest dimensions.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown about the middle of January; but the usual time is about the same period of the succeeding month, or not even until its close, if severe weather: to be repeated towards the end of March, and lastly, in the first weeks of April and May. The length of time that elapses between

* Mem. Caled. Hort. Soc., vol. ii. p. 222.

the sowing and readiness of the fruit for cutting, of course depends in chief upon the variety employed. But at all events, little time is gained by sowing before February is well advanced, and much more risk of failure incurred. On the average, fifteen weeks elapse; in the shortest and coldest days of winter, eighteen. As the spring advances, it decreases to eleven or twelve; these periods necessarily varying in different years. The mode of sowing, managing the seedlings, pricking out, &c., being the same as with cucumbers, only that a few degrees higher temperature is remarked, I shall refer the reader to that head to avoid repetition. It may be remarked in addition, that the pots in which the seed is sown, should be three or four inches deep. Each sowing is best performed at twice, four or five days being allowed to elapse before the second insertion is made; this guards as much as possible against failure. The pots should be plunged by degrees, and not at once, down to the rim. Those for pricking into must be about five inches in diameter. The first stopping is usually performed in the seed-beds.

RIDGING OUT.

The bed being formed, and the heat become temperate, so that the mould can be applied without danger of being scorched, it must be spread over about two inches thick, and a tumulus, with a flat top, fifteen inches in height, and of the same breadth at the base, formed in the centre of each light. In two or three days the plants may be inserted, care being taken to remove them with as little injury as possible to the roots; for in proportion as these are injured are the plants retarded. The removal should take place as soon after the attainment of the rough leaves as possible, or at the latest immediately on the appearance of the lateral runners. If the bed is not at this time

ready, those from the earth of the seed-beds must be moved into pots, and those already in them turned into larger ones, from whence they may be finally removed at a farther advanced stage of growth, without detriment; one plant only should be allowed to remain, for no more are required for each light. Water must be given with the precautions enumerated for cucumbers, and especial care taken not to wet the foliage, or to apply it too abundantly, and repeated two or three times until the plants are established. When completely rooted, the bed may be earthed by degrees to its full depth, sixteen inches, it being first added immediately round the cones, and pressed moderately firm as it is laid on. The pruning and training must be performed the same as in cucumbers, as also the same precautions taken to admit air and light, and to shade and cover, &c. It is in the training and management of the foliage in particular, that the generality of gardeners are careless, although the labours of the physiologist and chemist have demonstrated how important it is that every leaf should be kept in its natural posture and vigour. So convinced was Mr. Knight of the little attention paid to this point, that he took some melon plants under his especial care. He placed one under each light, the glass of which was six feet by four; the branches were trained regularly, and secured by pegs in every direction; and still further to present the largest possible surface of foliage to the light, the leaves were held erect at equal distances from the glass. As great injury is sustained by these from the common mode of watering, it was so performed as not to touch them. By this simple additional care, the other routine of their management being the same as usual, the fruit attained an extraordinary degree of perfection, and ripened in an unusual short space of time. Mr. Knight further directs, however,

that whenever a sufficient quantity of fruit is set, the production of more leaves is to be prevented, if they cannot be exposed to the light without overshadowing the fruit, by pinching off the laterals as soon as formed. No part of full-grown leaves, however, should be destroyed, though far distant from the fruit *. If the plants succeed well, they will spread over the entire bed in about five or six weeks; at which time a coating of fresh fermenting matter is generally required; if of dung, and exposed to the air, it must not be less than three feet wide on each side of the bed, firmly trodden down, commencing at its very bottom, digging a trench, if it was originally constructed in one. Earth must also be put on to the same depth as in the interior of the frame; if this is neglected, as is too often the case, the root often extends to the edge of the bed, and becomes dry before all the fruit is matured.

TEMPERATURE.

The temperature requires particular attention at the time of setting and ripening, though neglect at all the stages of growth is fatal. It must never fall below 70° or rise above 80°. The seed or nursery bed may continue about the minimum, but never below it; and the fruiting one as constantly approximating the maximum as possible.

Impregnation must be performed as directed for cucumbers.

When the runners completely touch the side of the frame, if the season is genial, it must be raised three or four inches by means of bricks, otherwise they must be pruned. From this the propriety of having only one plant to a light, is evident, for the runners

* Mem. Caled. Hort. Soc., vol. ii. p. 262. Trans. Hort. Soc. Lond., vol. i. p. 223.

being often six or seven feet long, and very numerous, require, if there is not room for training, the frame to be lifted long before the season will allow it.

As soon as the fruit is set, they must be looked over three or four times in a week, to observe which is the most vigorous and finest; of these, one that has the largest footstalk, and the nearer the main stem the better, must be left on each runner, and all others nipped off, the runner at the same time being broken away at the third joint above it. Eight melons on one plant of the large varieties, and about twelve of the smaller ones, is quite sufficient to be left; if more are suffered to remain, they will either be of inferior size and quality, or not ripen at all. By this pruning, fresh runners are often induced; but these must in like manner be stopped, and any fruit they may produce removed. If a superabundance are produced, which, especially if new seed is employed, will sometimes happen, it is necessary to thin them; and in doing this, the weakest and most luxuriant must alike be rejected, those of an average size being the most fruitful. It must always be kept in mind, that air should be admitted as much and as often as circumstances will allow. During mild and serene afternoons and evenings, the glasses may be entirely removed, but on no consideration left off all night. In very warm weather they may be kept off from ten in the morning until five, a shade being afforded to the plants during the meridian, if they flag at all. It is necessary, both for melons and cucumbers, that something should be laid between the fruit and the earth of the bed, otherwise it will be specked and injured in appearance; clean straw and reeds, spread in thin but regular layers, are often employed for this purpose. If tiles or pieces of board are made use of, it is of considerable service in forwarding the

ripening, to have them painted or charred black; but what would be still better, is coal-ashes spread over the surface of the bed two or three inches deep, and beat smooth. This, I am of opinion, is preferable, from its power of absorbing and retaining heat, and inferior in no other quality to drifted sea or river sand, recommended by Mr. Henderson, of Brechin Castle, N. B., which, he observes, extirpates the *slater* or *wood-louse*, by preventing it concealing itself from the rays of the sun; it keeps down the steam; affords a bed for the fruit as warm and as dry as tiles or slates; retains the moisture longer, whilst it becomes dry itself sooner than those coverings, and is a powerful preventive of that evil, the mildew *. If tiles or slates are employed, they must be put under the fruit as soon as it has attained the size of a walnut; the other materials immediately after the plants are well established. A regular moisture should be kept up by moderate waterings, applied with all the precaution intimated for cucumbers; but when the fruit is becoming ripe, water must be either altogether withheld, or applied very sparingly. About thirty or forty days usually elapse between the setting and full ripeness of the fruit; but this varies in the same bed, and even on the same plant. As it approaches to ripeness, it must be gently turned twice or three times during a week, otherwise that side which lies constantly on the ground will be blanched and disfigured. Its maturity is intimated by a circular crack near the footstalk, sometimes becoming yellowish; but more decidedly by the emission of a fragrant smell. The cutting should be performed early in the morning, and the fruit kept in a cool place until wanted, either in

* Mem. Caled. Hort. Soc., vol. i. p. 117.

an ice pail, or certainly in cold water. The whole of the stalk is left pertaining to it when cut.

TO OBTAIN SEED.

For the production of seed, some fruit of the earliest raised crops must be left; of these, the finest and firmest should be selected, the choice being guided by the same circumstances as are mentioned for cucumbers. No two varieties should be grown in the same frame, either when the seed is an object, for then it would be contaminated, or if the fruit is alone required, for their growth and vigour almost always differing, different treatment is required by each. Neither should cucumbers or gourds be allowed to vegetate in such a situation as to risk mutual impregnation by insects. Both of the melon and cucumber, such seed only should be kept as sinks freely to the bottom of water. Seed is best for sowing when three or four years old; if less than two, the plants raised from it are apt to produce a superluxuriance of vine, and a multitude of male blossom. If new seed is unavoidably employed, it should be hung in a paper or phial near the fire, until wanted, or be carried in the pocket for three or four weeks. If, on the contrary, the seed is very old, it should be soaked in milk-warm water for two or three hours before sowing. When twenty years old it has been known to produce fruitful plants.

HAND-GLASS CROPS.

For these, plants are required from sowings of the middle of March, April, or early in May, and whose fitness for planting out is marked by the rough leaf, &c., as intimated before.

The bed must be four and a half feet wide; in

length proportionate to the number of glasses, which must be at least four feet apart; and eight barrow-loads of dung being allowed to each glass, it will be about two and a half feet high. It may be founded in a trench, if the soil is dry; but it is best constructed on the surface.

The earthing, planting, and other points of management are precisely the same as for the frame crops. The temperature need not, however, be so high, the maximum required being 70°; but it must never sink below 65°, which may easily be accomplished by linings, &c. The runners must not be allowed to extend from beneath the glasses until June, or the weather has become genial and settled, but be kept within, as noticed for cucumbers. When allowed to escape, all dwindled or supervigorous shoots must be removed, and the training be as regular as for those in the frames. The glasses raised upon props must, however, be kept constantly over the centre, as a shelter to the capital parts. The bed requires to be hooped over for the support of mats in cold or wet weather, and at night. If, from deficiency of glasses, papered frames are employed, the most unremitting attention is required, the plants being very apt to spindle under them. They may, however, be employed with advantage in the place of mats for sheltering and shading. If the weather is at all unfavourable at the time the fruit is approaching maturity, it is highly advantageous to place hand-glasses over those that are growing exterior to the original one. The latest fruit seldom ripen even with the greatest care and attention, unless there are spare frames to inclose them entirely; those which do not are employed in pickling.

For a tolerable supply throughout the season, a small family requires one three-light frame and three

hand-glasses: these together will yield on the average thirty or forty melons. The largest establishment will not require more than four times as many.

PROPAGATION BY CUTTINGS.

Melons, like cucumbers, may be propagated by cuttings. Plants thus raised produce their fruit rather sooner than if raised from seed.

In conclusion, it may be remarked, that the directions and observations that have been elicited whilst treating of the cultivation of these two plants, reciprocally apply, and repetition has therefore been as much as possible avoided; three variations of importance only being required—a freer admission of air, a higher temperature, and much less water to the Melon.

CUCURBITA.

According to Scaliger, from curvitate ; *the first syllable being doubled, as in* populus, *&c.*

GOURD.

Cucurbita pepo, Pompion or Pumpkin, is a native of both the Indies. It is chiefly employed in the making of pies, &c. There are numerous varieties of it, varying in the shape and colour of their fruit; as, the globular; oval; pear-shaped; green; striped; marbled; yellow, &c. &c. One variety, of a pale buff or salmon colour, and globular form, grows to the weight of 110lbs. and upwards; it is known in France as the Potiron Jaune, and used in soups, but in particular from being mashed and eaten as potatoes

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or turnips, being of a very pleasant and peculiar flavour*. The Bottle-shaped is of little use for culinary purposes, but is remarkable as being of the form of a Florence or oil-flask.

Cucurbita melopepo, the squash.

Cucurbita succada, the vegetable marrow. Both these are cultivated for the fruit, which, being gathered when of the size of a goose's egg, is boiled whole in salt and water, laid upon toast, and eaten as asparagus. Of the squash, there are almost as many varieties as of the pompion, and similarly characterised. The young fruit is much used in pickles.

They are propagated by seed, which may be sown in a hotbed of moderate strength, under a frame or hand-glasses, at the end of March or early in April. In May they may be sown in the open ground beneath a south fence to remain, or in a hotbed if at its commencement, to forward the plants for transplanting at its close, or early in June.

The plants are fit for transplanting when they have got four rough leaves, or when of about a month's growth. They must be planted without any shelter on dunghills, or in holes prepared as directed for the open ground crop of cucumbers. Some may be inserted beneath pales, walls, or hedges, to be trained regularly over them, on account of their ornamental appearance. They may be treated in every respect like the cucumber, only they do not want even so much care. They require abundance of water in dry weather. When the runners have extended three feet, they may be pegged down and covered with earth at a joint; this will cause the production of roots and the longer continuance of the plant in vigour.

* Trans. Hort. Soc. Lond., vol. iii. p. 364.

The fruit for seed should be selected and treated as directed for the Cucumber. It is ripe in the course of September or October.

CYNARA.

From cinere, *according to Columella, because the land for Artichokes should be manured with ashes. Parkinson derives it from the ash colour of its leaves.*

ARTICHOKE.

VARIETIES.

There are two varieties,—the oval green, or French, which is considered by Miller as *Cynara scolymus;* and the globe or red, which he names *Cynara hortensis.* The latter is not only the largest and most fleshy, but the first has a taste, so peculiarly perfumed, as to be disagreeable to most persons not accustomed to it.

SOIL AND SITUATION.

Those plants produce the finest heads that are planted in a soil abounding in moisture, but in such they will not survive the winter. Nevertheless some persons grow them here, and make a fresh plantation annually. To enable them to survive the winter, those for the supply of suckers, as well as those for a lasting production, must have a rich, mouldy soil allotted to them. Manure must be applied every spring, and the best compost for them, perhaps, is a mixture of three parts well-putrefied dung and one part of fine coal-ashes. They should always have an open exposure, and, above all, be free from the

influence of trees; for if beneath their shade or drip, the plants spindle, and produce worthless heads.

TIME AND MODE OF PLANTING.

It is propagated by suckers, which are annually afforded by the parent plants in the spring. For planting, these must be slipped off in March or early April, when eight or ten inches in height, with as much of their fibrous roots pertaining as possible. Such of them should be selected as are sound and not woody. The brown, hard part by which they are attached to the parent stem, must be removed, and if that cuts crisp and tender, it is evidence of the goodness of the plant: if it is tough and stringy, it is worthless. Further, to prepare them for planting, the large outside leaves are taken off so low, as that the heart appears above them. If they have been some time separated from the stock, or if the weather is dry, they are greatly invigorated by being set in water for three or four hours before they are planted.

When planted, they should be set in rows four and a half feet by three feet apart, and about half their length beneath the surface. Water must be given them abundantly every evening until they are established, as well as during the droughts of summer, which will increase the vigour of the heads considerably. The only other attention they require during the summer, is the frequent use of the hoe. They produce heads the same year, from July to October, and will continue to do so annually, if preserved, in succeeding years, from May until June or July; consequently it is the practice to obtain a supply during the remainder of the summer and autumn to make an annual plantation in some moist soil, as the plants are not required to continue.

As often as a head is cut from the permanent bed,

the stem must be broken down close to the root, to encourage the production of suckers before the arrival of winter. In November or December they should receive their winter's dressing. The old leaves being cut away without injuring the centre or side shoots, the ground must be dug over, and part of the mould thrown into a moderate ridge over each row, it being put close about the plants, but the hearts left clear. If this dressing is neglected until severe frosts arrive, or even if it is performed, each plant must be closed round with long litter or pea haulm: it is, however, a very erroneous practice to apply stable-dung immediately over the plants previous to earthing them up, as it in general induces decay. As soon as February commences, all covering of this description must be removed. In March, or as soon as the shoots appear four or five inches above the surface, the ridges thrown up in the winter must be levelled, and all the earth removed from about the stock to below the part from whence the young shoots spring. All of these but two or at most three of the straightest and most vigorous must be removed, care being taken to select from those which proceed from the under part of the stock; the strong thick ones proceeding from its crown having hard woody stems, and are productive of indifferent heads. Those allowed to remain must be carefully preserved from injury. Every other sucker must be removed and every bud rubbed off, otherwise more will be produced, to the detriment of those purposely left. These must be separated as far apart as possible without injury, the tops of the pendulous leaves removed, and the mould then returned, so as to cover the crowns of the stocks about two inches. Some gardeners recommend, as soon as the ground is levelled, a crop of spinach to be sown, which will be cleared off the ground before the Artichokes cover it;

but this mode of raising or stealing a crop is never advisable, being always in some degree injurious.

Although the Artichoke in a suitable soil is a perennial, yet after the fourth or fifth year, the heads become smaller and drier. The beds in consequence are usually broken up after the lapse of this period, and fresh ones formed on another site.

If any of the spring-planted suckers should not produce heads the same year, the leaves may be tied together, and covered with earth, so as just to leave their tops visible, and, on the arrival of frost, being covered with litter, so as to preserve them, they will afford heads either during the winter or very early in the spring.

CYNARA CARDUNCULUS.—CARDOON, OR CHARDON.

The stalks of the inner leaves, when rendered tender by blanching, are used in stews, soups, and salads.

SOIL AND SITUATION.

A light, rich soil is most suitable to this vegetable, dug deep and well pulverised. The situation must be open, and free from trees, as, like the Artichoke, it is impatient of confinement.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown at the close of March, but for the main crop not until the early part of April, those plants raised from earlier sowings being apt to run at the close of autumn: for a late crop, a sowing may be performed in June. The best practice is to sow in patches of three or four

rows four feet apart each way, to be thinned finally to one in each place, the weakest being removed. The seedlings are nearly a month in appearing. If, however, they are raised in a seed bed, they will be ready for transplanting in about eight or ten weeks from the time of sowing, and must be set at similar distances as are specified above.

The plants of the first sowing are generally three weeks before they make their appearance; those from the later ones, about two. If, after a lapse of these times, they do not appear, it should be ascertained if the seed is decayed, and in that case, the sowing renewed. The seed must be sown rather thin, and covered with about half an inch depth of mould. When about a month old, the seedlings, when too thick, must be thinned to four inches apart, and those removed may be pricked out at a similar distance, if there is any deficiency of plants.

When of the age sufficient for their removal, they must be taken up carefully, and the long straggling leaves removed. The bed for their reception must be dug well and laid out in trenches as for celery, or a hollow sunk for each plant; but as they are liable to suffer from excessive wet, the best mode is to plant on the surface, and form the necessary earthing in the form of a tumulus. Water must be applied abundantly at the time of planting as well as subsequently, until they are established; and also in August, if dry weather occurs, regularly every other night, as this is found to prevent their running to seed. The only other necessary point to be attended to is, that they may be kept free from weeds during every stage of their growth.

When advanced to about eighteen inches in height, which, according to the time of sowing, will be in August, and thence to October, the leaves must be

closed together by encircling them with a hay-band; and earth placed round each plant, a dry day being selected for performing it. As they continue to grow, fresh bands and earth must be constantly applied, until they are blanched to the height of two feet, or about two-thirds of their stems. They will be fit for use in eight or ten weeks after the earthing first commences. Care must be had in earthing them up, to prevent the earth falling in between the leaves, which is liable to induce decay. The surface of the soil should likewise be beaten smooth, to throw off the rain. In severe weather their tops should be covered with litter, it being removed as invariably in mild weather: by this treatment, they may be preserved in a serviceable state throughout the winter.

TO OBTAIN SEED.

For the production of seed, which in this country seldom comes to maturity but in dry seasons, a few plants should be set in a sheltered situation, of the April sowing; of course not earthed up, but allowed the shelter of mats or litter in frosty weather. In the spring, the ground may be dug round them to destroy weeds, as well as to encourage the growth of the roots. The flowers make their appearance about the beginning of July, and the seed is ripe in September.

DAUCUS.

As some imagine from δαιω, though its taste is far from being pungent. Perhaps from δασυς, on account of the thickness of its root.

DAUCUS CAROTA.—CARROT.

VARIETIES.

There are a considerable number of varieties of the carrot, which are divided by horticulturists into two families; those with a regular fusiform root, which are named *long carrots*, and those having one that is nearly cylindrical, abruptly terminating, but continuing with a long slender tap root, which are denominated *horn carrots*. The first are employed for the main crops; the second, on account of their superior delicate flavour, are advantageously grown for early use. They are likewise commonly recommended for shallow soils.

Horn Carrots.—Early red horn.—Common early horn.—Long horn. This last is the best for the summer crop.

Long Carrots.—White.—Yellow.—Long yellow.—Long red, Chertsey, or Surrey.—Superb green-topped, or Altringham. The two last are the best for main crops.

SOIL AND SITUATION.

Carrots require a warm, light, fertile soil, dug full two spades deep, as they require to be deeper than any other culinary vegetable. With the bottom spit it is a good practice to turn in a little well-decayed manure; but no general application of it to the surface should be allowed in the year they are sown. But a spot should be allotted them which has been made rich for the growth of crops in the previous

year, or else purposely prepared by manuring and trenching in the preceding autumn. The fresh application of manure is liable to cause their growing forked, and to expend themselves in fibres, as well as to be worm-eaten. If, however, the want of manure must be obviated at the time of sowing, it should be used in a highly putrescent state, and but in small quantities, finely divided and well mixed with the soil. If the soil is at all binding, it should be well pulverised by digging very small spits at a time, &c. Mr. Smith, of Keith Hall, N. B., recommends pigeons' dung as the best manure for this crop: it not only prevents the maggot, but causes them to grow finer. He applies it in the same proportion as is usually done of stable manure*.

TIME AND MODE OF SOWING.

It is propagated by seed. The first sowing for the production of plants to draw whilst young, should take place in a moderate hotbed, during January, and in a warm border at the conclusion of February or early in March. At the close of the last month, or more preferably in the early part of April, the main crop must be inserted, though, to avoid the maggot, it is even recommended not to do so until its close. In May and July the sowing may be repeated for production in autumn, and lastly, in August, to stand through the winter, and produce in early spring. For sowing, a calm day should be taken advantage of; and previous to commencing, the seeds should be separated by rubbing them between the hands, with the admixture of a little sand; otherwise, by reason of their adhering by the hairs that surround their edges, they are clotted together, and cannot be sown regular. The surface of the bed should likewise be laid smooth, otherwise, in raking it, the seed will be drawn together in similar heaps. To avoid

* Mem Caled. Hort. Soc., vol. i. p. 129.

this, before raking, it may be gently trod in. The seed should be sown thin, and the beds not more than four feet wide, for the convenience of after-cultivation. The larger weeds must be continually removed by hand; and when the plants are seven or eight weeks old, or when they have got four leaves two or three inches long, they should be thinned; those intended for drawing young, to four or five inches apart, and those to attain their full growth, to eight or ten; at the same time, the ground must be small-hoed, which operation should be regularly performed every three or four weeks, until the growth of the plants becomes an effectual hindrance to the growth of the weeds. The crop to stand through the winter should, in frosty weather, be sheltered with a covering of litter, as if it occurs with much severity, it often destroys them. The hotbed for the first sowing of the year must be moderate, and earthed about sixteen inches deep; two or three linings of hot dung, as the heat decreases, will be sufficient to bring them to a state fit for use. These are the first in production, but are closely followed by those that have withstood the winter. The temperature must never exceed 70°, or fall lower than 65°; if it rises higher, it is a certain cause of weakness; if lower, it checks their advance. They need not be thinned to more than three inches apart.

At the close of October, or early in November, as soon as the leaves change colour, the main crop may be dug up, and laid in alternate layers, with sand, in a dry outhouse; previous to doing which, the tops, and any adhering earth, must be removed. A dry day should always be chosen for taking them up.

TO OBTAIN SEED.

For the production of seed, it is by much the best practice to leave some where raised. If, however, this

is impracticable, some of the finest and most perfect roots should be selected, and their tops not cut so close as those for storing; these likewise must be placed in sand until February or March, though some gardeners recommend October or November, then to be planted out two feet asunder, in a stiff loamy soil. Those left where grown, or those planted at the close of autumn, must, during frosts, have the protection of litter, it being invariably removed, however, during mild weather. As the seed ripens in August, which is known by its turning brown, about the end of August, each umbel should be cut; for if it is waited for until the whole plant decays, much of the seed is often lost during stormy weather. It must be thoroughly dried by exposure to the sun and air, before it is rubbed out for storing. For sowing, the seed should always be of the previous year's growth; if it is more than two years old it will not vegetate at all.

GLYCYRRHIZA.

From Γλυκυς, sweet, and Ριζα, a root.

GLYCYRRHIZA GLABRA.—LIQUORICE.

This perennial herbaceous plant is only admitted into the garden for its pharmaceutical properties.

SOIL AND SITUATION.

It thrives best in a rich, light soil, two or three feet deep, and which should be trenched completely to the bottom before planting. When manure is added, it should be regularly mixed throughout the texture of the soil. In shallow or poor ground it will not succeed. The situation cannot be too open.

TIME AND MODE OF PLANTING.

It is propagated by cuttings of the side roots, which spring from the crown of the plants, and run horizontally just beneath the surface, which may be planted in January, February, or early in March. Each set should be about six inches in length, not having less than three eyes. When planted, they are to be set in rows by the dibble, two feet apart each way, the upper end about two inches beneath the surface. The only cultivation they require is to be frequently hoed, to keep them clear of weeds throughout their growth; and in autumn, the decayed stalks to be cut down, and the earth gently stirred between the rows.

The roots are not fit for use until of three or four years growth. The season for taking them up is December, January, or February. A trench must be dug regularly along each row, quite down to the extremity of the principal roots, which always descend two feet and more.

HELIANTHUS.

From Ηλιος, *the sun, and* ανθος, *a flower.*

HELIANTHUS TUBEROSUS.—JERUSALEM ARTICHOKE.

SOIL AND SITUATION.

It flourishes most in a rich, light soil, with an open exposure. Trees are particularly inimical to its growth.

TIME AND MODE OF PLANTING.

As it never ripens its seeds here, though it blossoms sometimes in October, the only mode of propagation

is by planting the middle sized bulbs or cuttings of the large ones, one or two eyes being preserved in each. These are best planted towards the end of March, though it may be performed as early as February, or even in October, and continued as late as the beginning of April.

They are inserted by the dibble, in rows, three feet by two feet apart, and four inches deep. They make their appearance above ground about the middle of May. The only attention necessary is to keep them free from weeds, and an occasional hoeing, to loosen the surface, a little of the earth being drawn up about the stems. Some gardeners, at the close of July, or early in August, cut the stems off about their middle, to admit more freely the air and light; in other respects it may be beneficial to the tubers.

They may be taken up as wanted, during September; and in October, or as soon as the stems have withered, entirely for preservation in sand, for winter's use. They should be raised as completely as possible, for the smallest piece of a tuber will vegetate, and appear in the spring; it is for this reason that they are often allotted some remote corner of the garden; but their culinary merits certainly demand a more favourable treatment.

HYSSOPUS.

Probably from the Hebrew.

HYSSOPUS OFFICINALIS.—HYSSOP.

VARIETIES.

There are three varieties, distinguished by the colour of the flowers, the white, red, and blue; the last of which is most commonly cultivated.

SOIL AND SITUATION.

A dry soil is the one most appropriate for it. If it is grown on a rich or wet one, it becomes luxuriant; but from a deficiency of woody matter, is generally destroyed by the frost, as well as rendered less aromatic and powerful in its medicinal qualities.

TIME AND MODE OF PROPAGATION.

It is propagated by seed and slips of the branches and young shoots, as well as by offsets. The seed may be sown from the close of February until the end of May. Rooted offsets may be planted in March, April, August and September. Cuttings of the branches in April and May, and slips of young shoots in June or July.

The seed may be inserted broadcast, or preferably in drills, six inches apart, in either case not being buried deeper than half an inch. It is the usual practice, when the seedlings have attained the growth of six weeks, to prick them out twelve inches apart; but it is by much the best practice to raise them where they are to remain.

The slips and offsets are best planted at first in a shady or north border; they are generally firmly rooted in two months.

In September or October they are all fit for removal to their final stations. After every removal, whether of planting, pricking, &c., they must be watered plentifully and regularly until established. The only subsequent cultivation requisite is the keeping them free of weeds by frequent hoeings. In Spring and Autumn likewise, all decayed branches and flower stalks must be removed, those as edgings trimmed close, and the earth gently stirred around them.

LACTUCA.

From lacte, *on account of its milky sap.*

LACTUCA SATIVA.—LETTUCE.

VARIETIES.

There are many varieties, which are divided into families, the cos and the cabbage. The first are more grown in summer than winter; the second at all seasons, but more usually in winter, on account of their superior hardihood. The cos varieties are characterised by being of an upright growth, and, with the exception of the Brighton, requiring to have their leaves drawn together for blanching; the cabbage, as growing close to the ground, and producing a blanched heart, in the manner of a cabbage, without any assistance. The Cilicias are of a nature intermediate of the two. When young the cabbage varieties are in general sweeter than those of the cos at the same age; but of a full growth, this is reversed: hence the latter are preferred for salads, and the former for soups.

The cabbage varieties succeed better in a hotbed than the cos.

COS VARIETIES.

Brighton
Black-seeded green
Early Egyptian
Green
White or Versailles
Silver
Spotted or Leopard
Green and brown Cilicia
Lop

CABBAGE VARIETIES.

Drumheaded
Brown Dutch
Tennis ball
Hardy green, or Capuchin
Prussian
Prince's
Common white
Large white
Imperial
Grand admirable
Large Roman

SOIL AND SITUATION.

Lettuces thrive best in a light. rich soil, with a dry substratum. In a poor or tenacious one they never attain any considerable size, but run to seed prematurely. Like most other crops, that soil is to be preferred which is rich rather from prior cultivation than the immediate application of manure. It is of advantage to trench it; and if manure is necessarily applied at the time of insertion, it should be in a state of forward decay. For the first and last crops of the year a warm sheltered situation is required; but for the midsummer ones a border that is sheltered during the meridian, but far from being confined or under the shadow of trees, is to be preferred.

TIME AND MODE OF SOWING.

It is propagated by seed, the first of which is performed in a frame, on a warm border, or slender hotbed, at the close of January or early in February; at the close of this last month a larger one may be performed in any open situation, and repeated once every three weeks in small proportions until the end of July for summer and autumn use; to be continued at similar intervals until the close of September for winter and early spring. The sowing is always performed broadcast, moderately thin, each variety separate, and raked in even and light, care being taken that the bed is trampled upon as little as possible.

PRICKING OUT.

It is usual when the plants are about a month old, or two inches in height, to thin them to three or four inches apart, those removed being pricked out at similar distances. Those from the sowings in January and February in a similar situation to that in which they were raised; and thence

until August in any open situation. Those of the August sowing must be divided into two portions; the largest being selected and planted in an open compartment for late autumn use, and the smaller on a warm border for winter and early spring.

When planted out finally, they must be set in rows a foot apart each way, which is abundant for the largest variety, and not more than necessary for the smaller. At the time of every removal, whether of picking out or planting, water must be given moderately, and until the plants are rooted. It may be remarked, that transplanted lettuces never attain so fine a growth as those left where sown, nor become so soon fit for use: those which are planted out at once to remain, being better in these respects to those that are pricked out previous to final planting. The varying in their time of becoming fit for use, however, is of advantage, as by these means a more perfect succession is obtained. Those which are planted to withstand the winter, which they easily do if sheltered with hoops and matting during severe weather, and continue in a state fit for use, are best planted on the summit of ridges, as this is a great protection from excessive wet, from which they always suffer. In every stage of growth they must be kept free from weeds, well watered, and the earth around them frequently stirred for the extirpation of slugs and snails, which are particularly injurious, and are very prevalent in moist seasons.

When the cos varieties have attained an advanced growth, they require their leaves to be drawn together with a shred of matting, to render the interior blanched; care being taken that it is not performed so tight as to bruise them. Under every favourable circumstance for a vigorous growth, yet the plants, especially of the cos varieties, and during dry seasons,

will run up to seed before the heart is perfectly blanched: to retard this, it is an effectual practice at the time of tying them up, to cut out the centre of each, with a sharp knife.

FRAME CROPS.

The plants raised from the September sowing may be divided as directed for those of August, but in addition, some of the cos varieties may be planted on a warm border, to have the shelter of frames and hand-glasses. Some of the strongest of these may in succession, during November, December, and January, be planted in a moderate hot-bed, or on the borders of the stove, being removed with as little injury as possible to the roots, to bring them forward for immediate use.

Whilst in frames they require much attention. Being watered and shaded until established, they must afterwards have as much light and air admitted as possible, as well as a regular supply of moisture. At night the additional shelter of matting, and in severe weather an increased covering, must be afforded. The temperature should never exceed 80°, nor fall below 65°, otherwise the vegetation of the plants will be proportionately injured. The plants may be set in rows about six inches apart; but of those which are merely sheltering during the winter, on the return of mild weather at the beginning of March or April, every second one must be carefully removed and planted in a warm border at the usual open ground distance.

TO OBTAIN SEED.

To produce seed, some of the finest and most perfect plants of each variety that have survived the winter, or from the forwardest sowing of the year, should be selected. The seed from any that have run up prematurely cannot be depended upon. All other

plants must be removed from their neighbourhood, themselves being left at least a foot apart; neither is it allowable for two varieties to flower near each other, or only mongrel varieties will be obtained. Each stem is advantageously attached to a stake, as a support in tempestuous weather. It is to be observed, that the branches must be gathered as the seed ripens upon them, and not left until the whole is ready, as some will ripen two or three weeks before others, and consequently the first and best seed will be shed and lost. It must be particularly well dried before it is beaten out and stored.

Lettuce seed is considered to be best the second year; but when three years old, it refuses to vegetate *.

LAVANDULA.

From lavando, *because it was formerly used in baths on account of its fragrance.*

LAVANDULA SPICA.—LAVENDER.

SOIL AND SITUATION.

A VERY poor and light soil is best suited to this plant, being in such, more fragrant, longer lived, and more capable of enduring severe weather. In rich or moist soils it grows luxuriantly, but is in general destroyed during the winter. The situation cannot be too open.

TIME AND MODE OF PLANTING.

It is propagated by slips and cuttings of the current year's shoots, which may be planted in May and June, as well as by cuttings of those which are a year old; these are to be planted in March, April, and early

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* Le Quintin's Compl. Gard. vol. ii. p. 309.

May. Both slips and cuttings must be from five to seven inches in length, which, after being stripped to half their length of the lower leaves, are to be planted to that depth either in a shady border, or in any compartment, to have the shade of a mat during mid-day until they have taken root, in rows six inches apart each way. Water must be given in moderate quantity every evening until thus established.

Having attained sufficient strength, they may be moved to their final stations in September or October, which is the season to be preferred if the soil is not light and dry on which they have been raised; or they may be left until the succeeding spring. If it is grown in considerable quantity for medicinal purposes, which is the only claim it has for a place in the herbary, it must be planted in rows two feet apart each way, otherwise only detached plants are inserted along the borders. The only after-culture required is the occasional employment of the hoe, the decayed spikes and branches being removed in autumn, and the surface gently stirred with the spade in the spring.

The flowers are ready for gathering, either to dry or for distillation, in July or the end of June.

LEPIDIUM.

From λεπις, a scale, *on account of the form of the seed-vessel.*

LEPIDIUM VIRGINICUM.—AMERICAN CRESS.

SOIL AND SITUATION.

For the winter standing crops, a light dry soil, in an open but warm situation, should be allotted to it,

and for the summer, a rather moister and shady border is to be preferred. In neither instance is it required to be rich.

TIME AND MODE OF SOWING.

It is propagated by seed, which must be sown every six weeks from March to August, for summer and autumn, but only one sowing is necessary, either at the end of August, or beginning of September, for a supply during winter and spring.

It may be sown broadcast, but the most preferable mode is in drills nine inches apart. Water may be given occasionally during dry weather, both before and after the appearance of the plants. If raised from broadcast sowings, the plants are thinned to six inches apart; if in drills, only to three. In winter they require the shelter of a little litter or other light covering; and to prevent them being injured by its pressure, some twigs may be bent over the bed, or some light bushy branches laid amongst them, which will support it. The only cultivation they require is to be kept clear of weeds.

In gathering, the outside leaves only should be stripped off, which enables successional crops to become rapidly fit for use. When the plants begin to run, their centres must be cut away, which causes them to shoot afresh.

TO OBTAIN SEED.

For the production of seed, a few of the strongest plants raised from the first spring sowing, are left ungathered from. They flower in June or July, and perfect their seed before the commencement of autumn.

LEPIDIUM SATIVUM.—GARDEN CRESS.

VARIETIES.

There are three varieties—Plain-leaved, which is the one commonly cultivated for salads; Curly-leaved, equally good, and employed likewise for garnishing; Broad-leaved, seldom cultivated.

This salad herb is grown with and cultivated like mustard.

MELISSA.

From μελι, honey, *on account of the bee being supposed to collect it abundantly from their flowers.*

MELISSA OFFICINALIS.—BALM.

SOIL AND SITUATION.

The soil best suited to its growth, is any poor friable one, but rather inclining to clayey than silicious. Manure is never required. An eastern aspect is best for it.

TIME AND MODE OF PLANTING.

It is propagated by offsets of the roots, and by slips of the young shoots. The first mode may be practised any time during the spring and autumn, but the latter only during May or June. If offsets are employed, they may be planted at once where they are to remain, at ten or twelve inches; but if by slips, they must be inserted in a shady border, to be thence removed, in September or October, to where they are to remain. At every removal, water must

be given, if dry weather, and until they are established. During the summer they require only to be kept clear of weeds. In October the old beds require to be dressed, their decayed leaves and stalks cleared away, and the soil loosened by the hoe or slight digging.

Old beds may be gathered from in July, for drying, but their green leaves, from March to September; and those planted in spring will even afford a gathering in the autumn of the same year. For drying, the stalks are cut with their full clothing of leaves to the very bottom, and the process completed gradually in the shade.

MENTHA.

From Minthe, *a nymph commemorated in this herb, into which we are told she was transformed by Proserpine.* (Ovid. Metam. 10. v. 729.)

MENTHA VIRIDIS.—SPEAR OR GREEN MINT.

It is employed in sauces and salads, as well as dried for soups in winter. There are two varieties—the Broad and Narrow-leaved—equally good.

MENTHA PIPERITA.—BLACK OR PEPPER MINT.

This differs from the preceding chiefly in the intensity of its taste and dark colour of its foliage. It is only cultivated for distillation.

MENTHA PULEGIUM.—PENNYROYAL.

Is cultivated for its use in culinary and pharmaceutical preparations. There are two varieties—the Trailing, which is usually cultivated, and the Upright.

SOIL AND SITUATION.

These plants are best grown on a tenacious soil: even a clay is more suitable to them than a light silicious one. It should be moderately fertile, entirely free of stagnant moisture, and, consequently, on a dry subsoil, or well drained. A wet soil makes them luxuriant in summer, but ensures decay in winter. A border, or situation that is sheltered from the meridian sun, is always to be allotted them, as in such they are most vigorous and constant in production. A compartment entirely secluded from the influence of the sun is, however, equally unfavourable with one that is too much exposed.

TIME AND MODE OF PROPAGATION.

They are propagated by parting the roots in February or March, September or October, and by slips or offsets at the same seasons. The mints likewise may be increased, by cuttings of the annual shoots in May or June, as well as by cuttings of the roots either in spring or autumn. For production of green tops throughout the winter and early spring, the Spearmint is often planted in a hot-bed; and more rarely Pennyroyal, every three weeks during October and three following months.

Planting in the open ground, at whatever seasons, or by whatever mode, should if possible be performed in showery weather, or water must be given plentifully,

especially to cuttings. If propagated by divisions of the root, they must be inserted in drills two inches deep; if by slips or cuttings, they must be five or six inches in length, and their lower half being divested of leaves, planted to that depth, in every instance being set in rows ten inches apart each way. The only after-cultivation required, is the constant destruction of weeds, which are peculiarly injurious. After July, the produce of green tops is of little value; they should therefore be allowed then to advance to flower, which they will produce towards the beginning of September, when they are in the fit state for gathering, either for drying or distilling. In either case, the stalks should be cut just previous to the flower opening. At the close of September or beginning of October, the stems must be cut down as close as possible, the weeds cleared entirely away, and a little fine fresh mould spread over them. The beds should never be allowed to continue longer than four years; for by reason of continued gathering, the plants not only become weakened, but, the roots becoming matted, and greatly increased, produce only numerous diminutive shoots, or entirely decay.

FORCING.

For forcing, a moderate hot-bed is necessary, earthed over with mould about three inches thick: in this the roots may be inserted about four inches apart and one deep. They are sometimes only protected with mats, but frames of course are preferable. If it is inconvenient to construct a bed purposely, they may be planted in pots and plunged in any bed already in operation, or be set on the side of the stove. The temperature should never vary beyond the extremes of 70° and 80°.

OCYMUM.

Probably from ὄζω and μένω, on account of its lasting fragrance.

OCYMUM BASILICUM.—SWEET-SCENTED BASIL.

OCYMUM MINIMUM.—DWARF-BUSH BASIL.

SOIL AND SITUATION.

THEY thrive most in a rich, light soil, entirely free from any overshadowing body; but they require, especially for the earliest plants, a sheltered border. In wet earth, the seed always rots.

TIME AND MODE OF SOWING.

They are propagated by seed, which may be sown in a gentle hot-bed, with the shelter of a frame, at the close of March or early in April; to be thinned and those removed pricked out at the close of this latter month in a similar situation, to be finally removed in the course of May or commencement of June, when settled weather, into the open ground. This sowing may be repeated at the close of April or beginning of May, on a warm border; to be pricked and finally planted out, after a lapse of about five weeks respectively between each operation.

When thinned, the seedlings must be left at three inches apart, and those removed pricked out at a similar distance. The final planting must be made in rows, a foot apart each way. Some plants of all the sowings may be left where raised, to be gathered

from whilst young. Water must be given at every removal, as well as during every stage of their growth, when dry weather occurs. Weeds must be kept under, as well as the plants benefited by frequent hoeings.

The young leafy tops are the parts made use of. The supply is never-failing during summer, as they shoot out rapidly for successional supplies.

TO OBTAIN SEED.

To produce seed, some of the earliest raised plants must be left ungathered from. These flower from July to September, and accordingly ripen their seed in early or late autumn.

ORIGANUM.

From ορος, a mountain, *and* γανος, delight. *The delight of the mountain.*

ORIGANUM MARJORANA.—SWEET OR SUMMER MARJORAM.

ORIGANUM HERACLEOTICUM.—WINTER MARJORUM.

ORIGANUM ONITES.—COMMON OR POT MARJORAM.

SOIL AND SITUATION.

A LIGHT, dry, and moderately fertile soil is required for their healthy growth; and if it is one that has not been cropped for a considerable time, it is the more favourable for them. If the soil is wet or rich, they are deficient in their essential qualities, and the

perennials are unable to withstand severe weather. The situation cannot be too open.

TIME AND MODE OF PROPAGATION.

The sweet marjoram is propagated solely by seeds; the two perennials by seed, as well as by parting their roots, offsets, and slips of their branches. Sowing may be performed of all the species, from the conclusion of February, if open weather, to the commencement of June; but the early part of April is the usual time for performing it. Portions of the rooted plants, slips, &c., may be planted from February until May, and during September and October.

The sowing is performed either in drills, six inches apart, or broadcast; in either case, the seed being buried not more than half an inch deep. When the seedlings have attained a height of two or three inches, they must be thinned to six inches, and those removed may be pricked in rows at a similar distance apart each way. Those of the annual species are to remain; but of the perennials, to be finally removed during September, at the distances directed below, when raised from offsets, &c., water being given at every removal, and until the plants are established.

The slips, offsets, and partings of the root, are inserted in rows ten or twelve inches apart, where they are to remain; they must be watered moderately every evening, and shaded during the day, until they have taken root, which they soon do, and acquire a stocky growth.

The only cultivation that any of the species require is the frequent application of the hoe. In October the decayed parts of the perennials are cut away, and some mould from the alleys scattered over the bed about half an inch in depth, the surface of the earth between the stools being previously stirred gently.

The tops and leaves of all the species are gathered when green, in Summer and autumn, for use, in soups, &c.; and a store of the branches are cut and dried in July or August, just before the flowers open for winter's supply.

TO OBTAIN SEED.

There is little difficulty in obtaining the seed of the pot marjoram; if a plant or two are left ungathered from, it unfailingly ripens in the course of the autumn. But the exotic species seldom ripen theirs in this country; consequently it is usually obtained from the south of France or Italy. In favourable years, however, they sometimes perfect it late in autumn.

FORCING.

When the green tops are much in request, a small quantity of seed of the summer marjoram is sown in January or February, in a moderate hotbed. *Vide* MENTHA, "FORCING."

OXALIS.

Probably from οξυς, acid, *and* αλς, salt.

OXALIS ACETOSELLA.—WOOD SORREL.

THE flavour of this is much more grateful, and the leaves are more juicy than those of the garden sorrel (*rumex acetosa*), and the French or Roman sorrel (*rumex scutatus*). The cultivation required by them is identical. The leaves are employed at all seasons of the year, in salads, sauces, &c.

SOIL AND SITUATION.

The wood-sorrel requires a silicious, yet moist and moderately fertile soil, in a shady situation, as

beneath a hedge with a northern aspect. The garden-sorrel thrives best in any mouldy garden soil that tends to lightness rather than tenacity, and is not too poor. The situation must be open. French sorrel is most healthful in a light dry soil, that is tolerably fertile, in an open compartment.

TIME AND MODE OF PROPAGATION.

The rumexes are propagated by seed, and all of them by parting the roots, both which modes may be practised from the middle of February until the same period in May, and by the latter also in September and October. The finest plants are raised by seed, but those from portions of the roots are soonest in production.

The seed is best sown in drills, six or eight inches apart, and half an inch in depth. When two or three inches high, the seedlings must be thinned to three or four inches apart, and those removed, if required, pricked out at similar distances. In September or October, or in the March and April of the succeeding year, they may be removed into their final stations, in rows twelve inches apart each way, or, if the French, eighteen inches. The only attention they require down to this stage of their growth, is to be kept clear of weeds, and to have water given them in moderate quantities after each removal, until established.

When divisions of the root are employed, they must be set at once where they are to remain, at the final distances above mentioned; and the same attention paid in weeding and watering them. Established plants must in a like manner be kept constantly free from weeds. In summer, as they run up to seed, the stalks must be cut down as often as is required, to encourage the production of leaves. In autumn and spring, the surface of the ground should be gently

stirred, and in the former season, a little manure, or, in preference, a similar proportion of decayed leaves, turned in. Some gardeners raise fresh seedlings annually, but a fresh plantation is seldom necessary oftener than every fourth year; before which, however, it must be made, if the plants dwindle or produce diminutive leaves.

TO OBTAIN SEED.

For producing seed, some plants must not be gathered from, and allowed to run up unchecked. They flower in the course of June, July, and August, perfecting their seed in autumn. Wood-sorrel never produces seed. There is a tuberous rooted species of *Oxalis* lately introduced, whose tubers are eaten, like potatoes.

PASTINACA.

Derived, as some conceive, from pasco, *on account of its nutritive qualities; others from* pastinum, *a tool which it resembles in shape.*

PASTINACA SATIVA.—PARSNEP.

SOIL AND SITUATION.

The soil in which the parsnep succeeds best, is a rich, dry, sandy loam, and the deeper the better. The most inimical to it are gravel or clay. It is always beneficial to trench the ground two spades deep, a little manure being turned in with the bottom spit. If the soil is suitable to them, they are not much benefited by the general application of manure at the time of sowing, but often injured, in consequence of numerous fibres being induced. Dr.

Macculloch says, that in the Island of Guernsey, which has long been celebrated for the fineness of its parsneps, sea-weed is the manure chiefly employed *. Of excrementitious manure, that of pigeons is the best. Decayed leaves are also very favourable to its growth. The situation cannot be too open.

TIME AND MODE OF SOWING.

It is propagated by seed. The usual time for sowing is from the end of February to the beginning of April, but the earlier the better. It has been recommended in field cultivation to sow them in September; in the garden, when sown at this season, they also obtain a finer, but many of them in general run to seed. In the Isle of Guernsey, they regulate their time of sowing according to the soil; in the most favourable soils they sow in January; or if the soil is wet or stiff, they do not insert the seed until the latter end of March †.

The seed is sown broadcast, rather thin, and well raked in. The compartment being laid out in beds, not more than four feet wide, for the convenience of weeding, &c. When the seedlings are two or three inches high, they are carefully thinned to ten inches apart, and the weeds removed both by hand and small-hoeing. The beds require to be frequently looked over to remove all seedlings that may spring up afresh, as well as to be frequently hoed, until the plants so cover the ground as to render it impracticable. The roots may be taken up as wanted, in September, but they do not attain maturity till October, and which is intimated by the decay of the leaves. In November, part of the crop may be taken up, and the tops being cut close off, laid in alternate

* Caled. Hort. Mem.

† Caled. Hort. Mem.

layers, with sand, for use in frosty weather. The remainder may be left in the ground, and taken up as required, as they are never injured by the most intense frost, but, on the contrary, rendered sweeter. In February or March, however, any remaining must be extracted, otherwise they will vegetate. Being preserved in sand, they continue good until the end of April or May.

TO OBTAIN SEED.

For the production of seed, some of the finest roots, are best allowed to remain where grown; or else, being raised in February, planted in a situation, open but sheltered from violent winds. If of necessity some of those are employed which have been preserved in sand, such should be selected as have not had their tops cut off very close. They must be kept clear of weeds, and in dry weather watered plentifully twice a week. At the end of August the seed is usually ripe: the umbels may then be cut, and when thoroughly dried on cloths, the seed beaten out and stored. Seed should never be employed that is more than a twelvemonth old, as it has generally lost its vegetative power when of a greater age.

PHASEOLUS.

From its pods resembling a species of ship, supposed first to have been invented at Phaselis, a town of Pamphylia.

PHASEOLUS VULGARIS.—KIDNEY BEAN.

Of this vegetable there are two species, the one being a dwarf bushy plant, the other a lofty climbing one.

VARIETIES.

Of the Dwarfs there are twelve varieties:

Early Liver-coloured.
Early Red-speckled.
Early White.
Early Negro or Black.
Battersea White.
Canterbury White.
Black speckled.
Brown speckled.
Streaked or Striped.
Large White.
Dun-coloured.
Tawney.

Of the Runners there are six varieties:

Scarlet Runner.
Large White.
Large White Dutch.
Canterbury Small-white.
Small White.
Variable Runner.

SOIL AND SITUATION.

The soil for them may be anything rather than wet or tenacious, for in such the greater part of the seed in general decays without germinating; whilst those plants which are produced are contracted in their produce and continuance.

A very light mellow loam, even inclining to a sand, is the best for the earliest sowings, and one scarcely less siliceous, though moister, is preferable for the main summer crops; but for the later ones a recurrence must be made to a soil as dry as for the early insertions. In all cases the subsoil must be open, as stagnant moisture is inevitably fatal to the plants or seed. For the early and late crops, a

sheltered border must always be allotted, or in a single row about a foot from a south fence, otherwise the situation cannot be too open.

DWARFS.

TIMES AND MODES OF SOWING.

The sowing commences with the year. They may be sown towards the end of January in pots, and placed upon the flues of the hot-house, or in rows in the mould of a hotbed, for production in March, to be repeated once every three weeks in similar situations during February and March, for supplying the table during April, May and June. At the end of March and April a small sowing may be performed, if fine open weather, under a frame without heat, for removal into a sheltered border early in May. During May, and thence until the first week in August, sowings may be made once every three weeks. In September forcing recommences, at first merely under frames without bottom heat, but in October, and thence to the close of the year, in hot-beds, &c., as in January. Sowings when a removal is intended, should alway be performed in pots, the plants being less retarded as the roots are less injured, than when the seed is inserted in patches or rows in the earth of the bed. It is a good practice likewise to repeat each sowing in the frames without heat after the lapse of a week, as the first will often fail, when a second, although after so short a lapse of time, will perfectly succeed. In every instance the seed is buried one and a half or two inches deep. The rows of the main crops, if of the smaller varieties, may be one and a half, if of the larger two feet apart, the seed being inserted either in drills or by the dibble four inches apart, the plants however to be thinned to twice that distance.

If any considerable vacancy occurs, it may always be filled by plants which have been carefully removed by the trowel from where they stood too thick. A general remark, however, may be made, that the transplanted beans are never so productive or continue so long in bearing (although sometimes they are earlier) as those left where raised. The rows of the earlier crops are best ranged north and south. The seed inserted during the hottest period of summer, should be either soaked in water for five or six hours, laid in damp mould for a day or two, or the drills be well watered previous to sowing. The only after cultivation required, is the destruction of weeds, and earth to be drawn up round the stems.

The pods of both species are always to be gathered while young; by thus doing, and care being had not to injure the stems in detaching them, the plants are rendered as prolific and long-lived as possible.

FORCING.

The hot-bed must be of moderate size, and covered with earth eight or nine inches thick. When the heat has become regular, the seed may be inserted in drills a foot apart, and the plants allowed to stand six inches asunder in the rows. Some gardeners erroneously sow thick in a hot-bed, moulded over about six or seven inches deep, and remove the plants, when two or three inches high, to the above-mentioned distances, in another for producing, water and shade being afforded until they have rooted. Air must be admitted as freely as to the melon. The same precautions are likewise necessary as to keeping up the temperature, taking the chill off the water, &c., as for that plant. When the seed begins to sprout, the mould should be kept regularly moistened; and when grown up, water may be given moderately three times a week. The

temperature should never be less than 60°, nor higher than 75°.

Some plants of the hot-bed sowing at the end of March, are often, after being gradually hardened, planted in a warm border: this will at most hasten the plants in production a fortnight before those sown in the open ground in May.

Those sown under frames in March for transplanting into a border, when two or three inches in height, must in a like manner be hardened gradually for the exposure, by the plentiful admission of air and the total removal of the glasses during fine days. If any are raised in pots in the hot-house, they must in a like manner be prepared for the removal, by setting them outside in fine days, and there watering them with colder water. If the season is too ungenial after all to remove them even to a warm border, the plants are often inserted in patches, to have the protection of frames or hand-lights at night, or as the weather demands.

SAID TO BE PERENNIAL.

It has been lately stated in a provincial paper, that kidney-beans appear of a perennial nature. In Somersetshire, they have been observed to vegetate for several years—the plants being in the vicinity of a steam-engine, and so situated that the frost could not penetrate to the roots. I have not yet had an opportunity of putting this statement to the test of experiment.

RUNNERS.

As these are more tender, and the seed is more apt to decay, than those of the Dwarfs, no open ground crop must be inserted before the close of April, or

early May, to be continued at intervals of four weeks through June and July, which will ensure a supply from the middle of this last month until October. Some gardeners force them in a similar manner to the Dwarfs: they require similar treatment, but will endure a higher temperature by a few degrees. They are so prolific, and such permanent bearers, that three open-ground sowings of a size proportionate to the consumption, will in almost every instance be sufficient.

They are inserted in drills, either singly, three feet apart, or in pairs, ten or twelve inches asunder, and each pair four feet distant from its neighbour. The seed is buried two inches deep and four apart in the rows, the plants being thinned to twice that distance. If grown in single rows, a row of poles must be set on the south side of each, being fixed firmly in the ground: they may be kept together by having a light pole tied horizontally along their tops, or, a post being fixed at each end of a row, united by a cross-bar at their tops: a string may be passed from this to each of the plants. If the rows are in pairs, a row of poles must be placed on each side, so fixed in the ground, that their summits cross, and are tied together. They are sometimes sown in a single row down the sides of borders, or on each side of a walk, having the support of a trellis work, or made to climb poles which are turned archwise over it.

As the plants advance to five or six inches in height, they should have the earth drawn about their stems. Weeds must be constantly cleared away as they appear. When they throw up their voluble stems, those that straggle away should be brought to the poles, and twisted round them in a direction contrary to that of the sun: nothing will induce them to entwine in the contrary direction, or from left to right.

TO OBTAIN SEED.

For the production of seed, forty or fifty plants of the Dwarf species will be sufficient for a moderate-sized family, or thirty of the Runners. They must be raised purposely in May, or a like number from the crop in that month left ungathered from; for the first pods always produce the finest seeds, and ripen more perfectly. In autumn, as soon as the plants decay, they must be pulled, and, when thoroughly dried, the seed beaten out and stored.

PISUM.

From Πτισσω, *to pound or grind.*

PISUM SATIVUM.—PEA.

VARIETIES.

The varieties are numerous, differing much in their hardihood, prolificacy, height, &c.

Cormack's Early Dwarf Pea.
Early Charlton.
Early Golden Charlton.
Early Nichols' Golden Charlton.
Common Charlton.
Reading Hotspur.
Early Single Blossomed.
Early Warwick.
Early Dwarf Frame.
Early Double-blossomed Frame.
Dwarf Marrowfat.
Tall Marrowfat.
Green or Patagonian Marrowfat.
Early Green Nonpareil.

Knight's Marrowfat or Wrinkled Pea.
Spanish Moratto.
Imperial Blue.
Prussian Blue.
Egg.
White Rouncival.
Grey Rouncival.
Green Rouncival.
Blue Rouncival.
Tall Sugar*.
Crown or Rose.
Leadman's Dwarf.
Dwarf Sugar*.
Dwarf Spanish.
Sickle Pea.

SOIL AND SITUATION.

A soil moderately rich and mouldy is best suited to this vegetable. Rather inclining to aluminous for the lofty growers and main crops, but for the early and late ones, light and dry; if naturally otherwise, rendered so by the admixture of drift sand with the earth of the drills. Dwarf varieties will grow on poorer and lighter soils than the others. In an extremely rich soil they grow luxuriant but unproductive. They are rather injured than benefited by the application of unreduced dung at the time of sowing. Road dirt and rotted leaves form the best compost for them. For the early and late crops, that is, from October until the close of January, and during June and July, the sowings must be performed in sheltered situations, as south borders. In December, the rows are best drawn parallel with and

* The Sugar Peas are eaten like Kidney Beans.—G. S.

within a foot of the fence. At other seasons their site cannot be too open.

TIMES AND MODE OF SOWING.

They are propagated by seed, the sowing of which commences with the year. In January they may be inserted in sheltered borders, and larger supplies in an open compartment, and thence continued throughout February and until July, once every two or three weeks. During this last month, and in the first week of August, the last sowings must be made for production the same year. For the first production in the following year, a small sowing may be performed at the close of October, and repeated about the middle of November and December, though it often happens that these are scarcely a week forwarder than those inserted in the following February. The necessary extent of the various sowings may be determined with tolerable exactness from the experiments of Bradley; he found on the average that three rods of ground, containing eighteen double rows, afforded thirty-six quarts of shelled peas*.

The seed must be inserted in drills, or by the dibble in rows at a distance proportionate to the height to which the variety grows, as well as according to the season. Dwarfs at two feet for the early and late crops, but three feet for the main ones. Hotspurs and Charltons, under the same restrictions, at three or four feet. Marrowfats, at three and a half or four and a half. Knight's Marrowfats and other gigantic varieties, at five or six. Peas not intended to be supported, require the least room. At the early and late insertions, the seed should be buried an inch and a half deep, but for the main

* Gen. Treat. on Husb. and Garden. vol. iii. p. 19.

crops, two inches. With respect to the distances it may be inserted in the row; of the Frame, three may lie in the space of an inch; Charltons, Hotspurs, and Dwarfs, two in an inch; Blues and other middle-sized varieties for the main crops, three in two inches; the Tall and Knight's Marrowfat, as well as others of similar stature, a full inch apart; Moratto, Rouncivals, and other still taller varieties, an inch and a half asunder; whilst for the Patagonian, which is the tallest of all, attaining a height of eight or nine feet, two inches is not too wide. It may be remarked, that, for the winter standing crops, the drills may be made rather deeper, and the seed sown thicker. The best mode is to form the rows in pairs, the two being from nine to eighteen inches apart, according to the variety, and the usual space allowed between the pairs. Thus not only is the ground economised, but the plants are kept more erect, a row of sticks being placed on the outside of each row, gradually leaning towards each other, and closing at the summit. When the summer and autumn sowings are performed, if dry weather is prevalent, the seed should be soaked in water for two or three hours previous, or the drills well watered.

When the plants have advanced to a height of two or three inches, they are to be hoed, the weeds cleared away, and earth drawn around their stems. This should be performed twice or three times gradually as they ascend, previous to the sticks being placed. It should be performed in dry weather, and the leaves never covered, or in wet weather they decay. For the winter standing crops it should be especially attended to, as it protects them greatly from frost. Peas are always best supported by sticks; if it is neglected, even for the dwarf varieties, they not only produce less, but sooner decay, are inconvenient to cultivate and gather from, and never so fine. Sticking is not

required until the plants are six inches in height, or show their tendrils. If, during the time of blossoming, or swelling of the fruit, continued drought should occur, water may very beneficially applied, it being poured between the rows, if they are in pairs, or otherwise in a shallow trench on one side of each. Watering the leaves is rather injurious. Failures in the rows of the earliest crops, whether from mice or other causes, may be rectified by transplanting. This is best performed in March; the plants thus removed must be watered until they have taken root, and also shaded, if the weather is hot. It is a good practice to nip off the top of the leading shoots of the early and late crops as soon as they are in blossom, as it greatly accelerates the setting and maturity of the fruit. Too much care cannot be taken when the pods are gathered, not to injure the stems. I have heard it stated from lengthened experience, that if the pods are cut off with scissors, the plants produce one-fourth more than when roughly gathered from. Bradley makes nearly a similar observation *. From the main crops, or where there is no necessity for precipitation on account of bringing them to table early, the pods should not be gathered until the peas have become plump and moderately firm, yet green and tender. The more regularly the plants are gathered from, the longer they continue in production, as the later pods never attain maturity if the earlier ones are allowed to grow old before they are gathered.

In very severe weather, the winter standing crops require the shelter of litter or other light covering, supported as much as possible from the plants by means of branches laid between the rows. Mr. J. Laird, gardener, at Portmore, N.B., employs straw

* Gen. Treat. on Husband. and Garden., vol. iii. p. 21.

ropes or twisted bands for this purpose, which he fixes along each side of the rows with wooden pins, driven into the ground *. Whichever mode of shelter is adopted, it must be always removed in mild weather, otherwise the plants will be spindled, and rendered weaker. For the Imperial Blue, Frame, and other Dwarf varieties, the sticks need not be more than three feet high; for the Prussian Blue, Hotspur, and other middle-sized varieties, about five; for the Knight's Marrowfat, and other tall ones, at least seven; and for the Patagonian, not less than eight. The best wood for this purpose is the *brush*, or fan-shaped branches of the hazel, &c. Before they are employed, the ends that are thrust into the ground should be charred, or moderately burnt, which effectually preserves them from decay. If this is attended to, and when no longer required, the sticks, if thoroughly dry, on a fine day, are stored in a dry shed, they will last for three or more years.

TO OBTAIN SEED.

For the production of seed, leave some rows that are in production during July, or sow purposely in March. Care must be taken, however, that no two varieties are in blossom near each other at the same time, but a lapse of at least three weeks should occur, otherwise no perfect variety can be obtained. We are much in want of observations on this point. If Hotspurs and Marrowfats are sown on the same day, the latter will not bloom for nearly four weeks after the first. If the Frame variety and the Moratto are similarly inserted, the latter will succeed the first in about five weeks. The plants intended for seed

* Mem. Caled. Hort. Soc., vol. ii. p. 93.

ought never to be gathered from. When in blossom, all plants which do not appear to belong to the variety among which they are growing should be be removed. They are fit for harvesting as soon as the pods become brownish and dry. When perfectly free from moisture they should be beaten out, otherwise, if hot showery weather occurs, they will open and shed their seed. Seed peas preserve their power of germinating for eight or ten years.

FORCING.

Forcing commences in December, in the early part of which month they may be sown in a hotbed to remain, or thick, to transplant, during the succeeding month, into others for production. These may be repeated in January, and the transplanting take place in February. It is also a common practice to sow in a warm border during October, and the plants being cultivated as a natural ground crop, are removed into a hotbed during January.

The hotbed must be moderate, and earthed equally over, to a depth of six or eight inches, with light fresh mould, not particularly rich. The seed must be buried one inch and a half deep. The frame, which is required to be two feet and half high behind, and one and a half in front, ought to be put on three or four days before the crop is inserted, that the steam and heat may abate. Seed may likewise be sown at the above times in pots or pans, and placed round the bins of the stove. At the close of September, also, some peas may be sown in pots, and sunk in the earth of any open compartment; when the frost commences, to be removed into the green-house. A border of fresh earth being made in the front of it, early in December the plants are removed into it, in rows two feet asunder, or, still better, in pairs, with ten inches interval, and two feet

and a half between each pair. These will come into production about the middle of March.

In every instance, as stated above, the rows should be two feet, or in pairs, at two feet and a half apart, the seed or plants being set an inch asunder. The plants are ready for moving when an inch or two high. They must be shaded and gently watered until they have taken root. As much earth should be preserved about their roots at the time of removal as possible. Transplanted peas are most productive, and run the least to straw in the forcing frames. Air must be admitted as freely as possible, under contingent circumstances, the same precautions being necessary as for cucumbers. Water must be given at first sparingly, otherwise decay or super-luxuriance will be occasioned; but when they are in blossom, and during the succeeding stages of growth, it may be applied oftener and more abundantly, as it is necessary for the setting and swelling of the fruit. The shading during hot days, and covering at night, must also be particularly attended to. From three to five months elapse between the times of sowing and production, according to the fineness of the season length of the days, &c.

The temperature employed in forcing may be either progressive, beginning at 40° and 50°, for the extremes, at the time of sowing, rising to 52° and 66° when in blossom, and to 55° and 70° while the fruit is swelling; or the temperature may be uniformly kept up throughout their growth, having 50° for the minimum and 70° for their maximum.

PORTULACA.

According to Salmasius, it should be written porculata, *from* porcula, *a pig, whence it was also called* porcellia *and* porcacia; *by the Greeks,* Χοιροβοτανιον.

PORTULACA OLERACEA.—GREEN OR GARDEN PURSLANE.

PORTULACA SATIVA.—GOLDEN PURSLANE.

It is now but little noticed, and only cultivated as a salad and pot-herb.

SOIL AND SITUATION.

A light rich soil is the one in which they thrive most. They must always have a warm situation, a south border being generally allotted to them.

They are propagated by seed, which may be sown in February and early March, in a moderate hotbed, to remain where sown; and at the close of this last month, as well as once a month during the course of April, May, and the summer months, until the end of August, in the open ground

The sowings are performed broadcast, or in drills, six inches apart; in either mode, very thin and buried about half an inch. The plants very soon make their appearance. They must be kept clear of weeds, and be thinned to six or eight inches asunder. In dry weather water is required to be given moderately two or three times a week. In general, they are ready for gathering from in six weeks after sowing, the young shoots being made use of from two to five inches in length, which being cut down low, shoot out again. These observations and directions apply

equally to the open-ground and hotbed crops. The latter require the air to be admitted as freely as possible, the temperature ranging betwen 50° and 75°.

TO OBTAIN SEED.

For the production of seed, a small quantity of which will suffice for the largest family, some of the earliest border-raised plants must be left ungathered from, the strongest and largest leaved ones being selected; they blossom in June and July. They must be cut immediately that the seed is ripe, laid on a cloth, and, when perfectly dry, thrashed. The refuse is best separated by means of a very fine sieve.

POTERIUM.

From the Greek, ποτηριον, *a* cup.

POTERIUM SANGUISORBA.—SMALL OR UPLAND BURNET.

They are used in cool tankards, soups, and salads.

SOIL AND SITUATION.

It delights in a dry, poor soil, abounding in calcareous matter; any light compartment that has an open exposure, therefore, may be allotted to it, the only beneficial addition that can be applied being bricklayers' rubbish or fragments of chalk. A small bed will be sufficient for the supply of a family.

TIMES AND MODES OF PROPAGATION.

It may be propagated either by seed, or by slips and partings, or offsets of the roots. The seed may

be sown towards the close of February, if open weather, and thence until the close of May; but the best time is in autumn, as soon as it is ripe; for if kept until the spring, it will often fail entirely, or lie in the ground until the same season of the following year, without vegetating. It may be inserted in drills, six inches apart, or broadcast; in either mode, thin, and not buried more than half an inch. The plants must be kept thoroughly clear of weeds throughout their growth. When two or three inches high, they may be thinned to six inches apart, and those removed placed in rows at the same distance, in a poor, shady border, water being given occasionally until they have taken root, after which they will require no further attention until the autumn, when they must be removed to their final station, in rows a foot apart. When of established growth, the only attention requisite is to cut down their stems occasionally in summer, to promote the production of young shoots, and in autumn to have the decayed stems and shoots cleared away.

If propagated by partings, &c., of the roots, the best time for practising it is in September and October. As it grows freely from seed, this is not usually practised. They are planted at once where they are to remain, and only require occasional watering until established. The other parts of their cultivation are as for those raised from seed.

TO OBTAIN SEED.

For the production of seed, some of the plants must be left ungathered from, and allowed to shoot up early in the summer; they flower in July, and ripen abundance of seed in the autumn.

RAPHANUS.

As some suppose, from ραδιως and φαινεσθαι, on account of its quick vegetation; but the first word might be changed to ραπις, from the form of its root.

RAPHANUS SATIVUS.—RADISH.

VARIETIES.

There are two kinds of radish, the fusiform, or spindle-rooted, and the globular, or turnip-rooted; and these again are divided into the spring and autumn varieties. As for the designation of short and long-top, by which the old gardeners divided the varieties, I perfectly agree with Mr. Strachan, the gardener of the London Horticultural Society, in considering it is giving importance to a difference that is by no means permanent. The first may be sown at all times of the year; but the last, requiring a greater length of time to perfect their roots, can only, as the name implies, be obtained during the latter part of the year. A description of the following varieties is given by Mr. Strachan *.

SPRING VARIETIES.

FUSIFORM ROOTED.

1. Long White, called also the *White Transparent, White Italian,* and *Naples Radish.*
2. White Russian; probably the *raphanus sativus* of Gerard.
3. Twisted Radish, of Mons.

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* Trans. Hort. Soc. Lond., vol. iii. p. 436—46, and vol. iv. p. 10.

4. Scarlet or Salmon, or Scarlet-transparent Radish.
5. Purple, formerly called exclusively the Short-topped.
6. Red-necked White.

TURNIP-ROOTED.

7. White Turnip is the only one noticed by Gerard, as the *raphanus or biculatus.*
8. Early White Turnip.
9. Pink, Rose-coloured, Scarlet, and Crimson Turnip.
10. Purple Turnip.
11. Yellow Turnip.

AUTUMN AND WINTER VARIETIES.

These are all of the turnip-rooted kind; and in the following list, by Mr. W. Christie, under-gardener to the London Horticultural Society, they are described in the order they follow in coming into use.

1. Yellow Turnip.
2. Round Brown.
3. White Spanish, is Miller's *raphanus albus orbicularis.*
4. Oblong Brown.
5. Black Spanish.
6. Large Purple Winter, or Purple Spanish.

SOIL AND SITUATION.

The soil best suited for this vegetable is a mouldy loam, rather siliceous than otherwise, and moderately fertile. It should be dug a full spade deep, and well pulverised. The subsoil is best to be rather hard *. Manures hould not be applied at the time of sowing, if avoidable, as it is apt to cause the roots to be fibrous. If employed, it should be in a finely-divided

* Rutter's Garden. Univers. Guide, p. 30.

putrescent state. The situation should always be open, but for early and late crops, warm and sheltered.

TIMES AND MODE OF SOWING.

It is propagated by seed, which may be sown at all times throughout the year. For the earliest productions, during December, January, and February, in a hotbed; and in the open ground once a month during winter, and every fortnight during the other seasons of the year.

In the open ground, the seed is generally sown broadcast, and well raked in, but in drills is much the most preferable mode; in either case, it must be inserted thin, and buried half an inch deep; thick sowing causes the tops to be large, and the roots sticky. If broadcast, the beds should be laid out four or five feet wide, divided by alleys a foot in width, the earth from which may be thrown out to raise the beds, or not, according as the season renders it desirable for them to be dry or moist. If drills are employed for the fusiform-rooted, they are required to be three inches asunder; for the turnip-rooted, four or five, and for the Spanish, &c., six or eight.

When the seedlings are well up, and advanced to five or six leaves, they are ready for thinning; the spindle-rooted to three inches apart, the turnip-rooted to four, and the larger varieties to six. These spaces, however, require to be rather increased in moist warm weather. In dry weather they ought to be watered regularly every night, as the goodness of their flavour and tenderness depends upon their rapidity of growth, which is chiefly accelerated by a constant supply of moisture. The early and late crops that have to withstand the attacks of frost, &c., should be kept constantly covered with dry straw or fern, to the depth of about two inches, or with matting, supported by short sticks, until the plants make their

appearance, when the covering must be removed every mild day, but renewed towards evening, and constantly during frosty or tempestuous weather. Some gardeners sow lettuces, but more commonly spinach, with this crop. Others do the same with carrots among the early sown ones; so that if the radishes are killed by the frost, which sometimes occurs, the carrots supply their place; or even if both survive, the former being drawn young, and the carrot seed not vegetating for three weeks or more after that of the radishes, there is room sufficient for them both to succeed. The practice of mixing crops is rather to be avoided than commonly followed.

The time of drawing radishes is by no means indifferent. They eat in the greatest perfection if pulled in the morning before the sun has attained any power, and laid in a cool, damp place until wanted. The bed should have a plenteous watering the morning before that on which they are taken, but none afterwards until subsequent to the drawing. In November, those wanted for winter must be taken up during dry weather, and preserved in sand.

TO DRAW FOR SALADS.

To draw small, when the seminal leaves are pertaining, sowings must be made once a week. The management is precisely that required for rape, mustard, &c. *Vide* "SINAPIS."

TO OBTAIN SEED.

For the production of seed, in April, or early May, some of the most perfect plants of a main crop, when in full vigour, must be taken up with as little injury as possible to the roots and leaves, and planted in rows three feet asunder each way, being inserted by the dibble completely down to the leaves. Water must be applied as well until they have taken root,

as occasionally throughout their growth, especially when in flower. If practicable, it is best to leave some plants where raised. To obtain seeds of the Black Spanish, some seeds must be sown in March, or some of the winter standing crop left or transplanted during that month. The flowers open from June until August, and their pods are of a size fit for pickling, as they must be gathered whilst young and tender, during that last month, or July. For seed, they must be cut as soon as they become of a brown hue, and being well dried, otherwise it will thresh with difficulty, it may be stored. Two varieties must never be raised near each other, and seed of the previous year's raising should always be employed. The seeds of the different varieties are easily distinguished by an experienced seedsman. Those of the Long White Radish, are small, flat and pale; of the Scarlet and Purple fusiform-rooted, large, and of the first very light coloured, compared with those of the latter; of the White Turnip, small, round and brown; Scarlet Turnip, rather larger, and somewhat darker; Purple Turnip, larger, and brown, being similar to the long-rooted Purple, except in size*.

FORCING.

A moderate hotbed is required for this crop, of a length according with that of the frame to be employed; the mould about eight inches deep, on the surface of which the seed is to be sown as soon as the violent heat is abated, and an additional half inch of mould sifted over it. The seedlings are in general up in less than a week, and in six they will be ready to draw. Throughout their growth air must be admitted as freely as is allowable. The glasses,

* Trans. Hort. Soc. Lond., vol. iii. p. 446.

however, must be closed on the approach of evening, and mats or other covering put on in proportion to the severity of the season. When the mould appears at all dry, a light watering must be given during noon. The plants must not stand nearer than two inches to each other. The temperature required is from 50° to 70°; and it must be kept to this heat by moderate coatings, as required.

If there is a deficiency of frames, hoops and mats may be employed, a frame of boards being formed round the bed, light and air being admitted as freely and as often as possible. If seed is sown within a frame without any bottom heat, the plants will be two or three weeks forwarder than if sown in the open ground.

RHEUM.

From ῥέω, to spread.

RHEUM RHAPONTICUM.—RHUBARB.

RHEUM HYBRIDUM.—RHEUM.

This species grows to a much greater size than the preceding, and is more succulent. It has been introduced to the Kitchen Garden by Mr. D. Judd, gardener to C. Campbell, Esq., of Edmonton *.

SOIL AND SITUATION.

The soil best suited to these plants is one that is light, rich, deep, and moderately moist. A poor heavy or shallow soil never produces them in perfection. The compartment cannot be too open.

* Trans. Hort. Soc. Lond., vol. iii. p. 143.

TIME AND MODE OF SOWING.

It may be propagated by cuttings, but the mode almost universally practised is by seed. This should be sown soon after it is ripe in September or October, for if kept out of the ground until the spring, it will often continue dormant for twelve months: if the danger of this, however, is risked, it must be inserted early in February or March. The seeds are best inserted in drills three feet apart and an inch deep, the plants to remain where raised; for although they will bear removing, yet it always checks and somewhat lessens their growth. When they make their appearance in the spring, and have been thoroughly cleared of weeds, they may be thinned to six or eight inches asunder, and the surface of the ground about them loosened with the hoe. Towards the conclusion of summer, when it can be determined which are the strongest plants, they must be finally thinned to three or four feet, or the hybrid to six. They must be continually kept clear of weeds. In autumn, when the leaves decay, they are removed, and the bed being gently turned over, a little well-putrefied stable-dung added, and some of the earth applied over the stools. In the spring, the bed may be again dug, previous to the plants making their appearance; and as the stalks, when blanched, are much less harsh in taste, require less sugar to be rendered palatable, and are greatly improved in appearance, as T. Hare, Esq., Assistant Secretary to the Horticultural Society, accidentally discovered *, at this period a trench may be dug between the rows, and the earth from it laid about a foot thick over the stool. This covering must be removed when the cutting ceases, and the

* Trans. Hort. Soc. Lond., vol. ii. p. 258.

plants allowed to grow at liberty. As the earth in wet seasons is apt to induce decay, the covering may be advantageously formed of coal-ashes or drift sand, which are much less retentive of moisture.

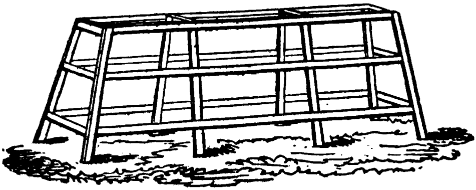
TO OBTAIN SEED.

Those plants produce the seed in greatest perfection that are not gathered from, but on no account must they be subjected to the process of blanching. Two-year-old plants often produce seed, but in their third year always. It must be gathered as soon as ripe, and great care taken that none is scattered over the beds, for the plants thence produced often spring up and greatly injure the old plants by growing unobserved amongst them.

FORCING.

For forcing this plant, Mr. D. Judd, beforementioned, has a single row of plants three feet apart, inserted in ground that has been trenched two spades deep, and dressed with well-putrefied dung at the time. The forcing may commence in December. The plants may be first covered either with sea-kale or common garden pots (size twelves), and enveloped with fermenting dung, under which they come up speedily and fine. The pots are then removed, and large hand-glasses substituted. Covering is required every night, and, in dull weather, with thick mats. By this mode, however, the plants are very liable to be broken, as their leaves soon touch the sides. A frame was found much less objectionable, formed by driving stakes into the ground on each side of the bed, alternating with the plants. These are to be three feet high above ground, and the space between the two rows of stakes two feet at the bottom, but approaching each other, and fastened by cross pieces

so as to be only fifteen inches apart at top. To the sides and top, stout laths are fixed, to prevent the dung falling upon the plants, as represented in the accompanying sketch.



The dung, Mr. Judd says, may be either fresh, or that which has already undergone fermentation. It must be placed all round the frame eighteen inches thick, and the top covered with long litter. The temperature in the interior should have a range from 55° to 60°, but never exceeding. If it rises too high, two or three large holes made through the top soon corrects it. If pots are used, the dung must be turned over. A frame renders hand-glasses or any other cover unnecessary, requires much less attention, and produces plants of excellent quality. Rhubarb may be forced without either pots or frame, by merely covering the plants six inches deep with light litter, care being taken that the plants are not injured*. The great objections to these modes of forcing are the extent of ground required, the very large quantity of dung necessary, and the great trouble attending them. To obviate these, President Knight has adopted the following mode:—In the winter, as many plants as may be necessary are placed in large

* Trans. Hort. Soc. Lond., vol. iii. p. 143—145.

deep pots, each pot receiving as many as it can contain, and the interstices entirely filled up by fine sandy loam being washed in. The tops of the roots are placed on a level with each other, and about an inch below the surface. These being covered with inverted pots of the same size, may be placed in a vinery or hot-bed, and, on the approach of spring, probably any time after January, any room or cellar will be sufficiently warm. If copiously supplied with water, the plants vegetate rapidly and vigorously, and each pot will produce three successional cuttings, the first two being the most plentiful. As soon as the third is gathered, the roots may be changed, and those removed re-planted in the ground, when Mr. Knight considers they will attain sufficient strength to be forced again in a year's time. If not, it is of little consequence, as year-old roots raised from cuttings, or even seed sown in autumn, are sufficiently strong for use *.

ROSMARINUS.

From ros, *dew, and* marinus, *on account of its affecting maritime situations. Poetically implying "the Dew of the Ocean."*

ROSMARINUS OFFICINALIS.—ROSEMARY.

VARIETIES.

There are three varieties—the Green, Golden-striped, and Silver-striped. The first is the one in general cultivation.

* Trans. Hort. Soc. Lond., vol. iii. p. 154.

SOIL AND SITUATION.

It thrives best on a poor, gravelly soil, in which there is a mixture of old mortar, or other calcareous matters. In such, or when the plants are self-raised on an old wall, they will bear our severest winters; but in a rich soil they become succulent, lose much of their aromatic nature, and perish in frost. For the green variety, the situation may be open, but the other two being tender, require to be planted beneath a south wall, or in pots, to be allowed the shelter of a green-house in winter.

TIMES AND MODES OF PROPAGATION.

It may be propagated by cuttings and rooted slips during any of the spring months, or by layers during the summer. But the finest plants are raised by seed, which, indeed, and by layers, is the only mode of propagating the gold and silver-striped varieties practised. The sowing must take place in March or early April.

The rooted slips and the cuttings of the young shoots must be from five to seven inches long, and planted in a shady border, in rows eight or ten inches apart. Previous to being inserted, the leaves, from the lower two-thirds of their length, should be stripped off, to which depth they are buried. Layers may be formed by cutting a young branch half through on its under side, and being then pegged down an inch or two below the surface, it will emit roots above the section, and become an established plant by autumn. Water must be applied abundantly at the time of planting, and occasionally afterwards, until established.

If raised from seed, it must be sown in drills one inch deep and six apart, though it may be inserted broadcast and raked in.

The plants, by whichever mode they are raised,

require no further care than to be kept clear of weeds. In September they must be transplanted to where they are intended to remain, being performed in preference during mild, showery weather; but if not removed thus early in the autumn, they are best left until the following March. They may be either grown in rows two feet apart each way, or trained in a fan form against a wall.

RUMEX.

From Ρυομαι, to be drawn out.

VARIETIES.

Of this species there are two varieties—the Common Long-leaved and the Broad Long-leaved. All these are more acid than grateful. The broad-leaved of this last species is the most succulent.

For particulars necessary to their cultivation, *vide* "Oxalis."

RUTA.

Adopted, according to Varro, from the Greek Ρυτη, *which is derived from* ρυω, to defend; *being considered in those days a powerful preserver of health.*

RUTA GRAVEOLENS.—RUE.

It was formerly designated *Herb-Grace.*

SOIL AND SITUATION.

It thrives best in a poor brick earth, in which a portion of calcareous rubbish has been mixed. It

will not endure the application of dung or a rich soil, for although this causes a luxuriant growth in summer, death is as certainly produced by severe frosts. The compartment may be open and unsheltered.

TIMES AND MODES OF PROPAGATION.

It is propagated by slips and cuttings as well as from seeds; the first two modes being usually practised as being the most easy. It may be planted or sown any time during the spring. The seed may be sown in drills six inches apart and one deep. The seedlings are not long in making their appearance, and only require to be thinned to a similar distance in the rows, and kept free of weeds.

The rooted slips, or cuttings, may be planted on a poor, shady border, and watered occasionally until taken root.

In the autumn, by whichever mode raised, the plants may be removed to their final compartment. During their after-growth, they must be kept pruned in a shrubby form, and never be allowed to produce seed unless wanted. The decayed branches, &c., may be removed in the spring and autumn, and the surface of the bed stirred with the spade.

SALVIA.

From salveo, *to be safe, on account of the sanative properties with which it was supposed to be fraught.*

SALVIA OFFICINALIS.—GARDEN SAGE.

It is now sometimes used medicinally in the form of an infusion, but principally in culinary preparations.

VARIETIES.

Of this are several varieties, as, 1. The Common Green.—2. Wormwood.—3. Green with variegated leaves.—4. Red with variegated leaves.—5. Painted or Particoloured.—6. Spanish or Lavender-leaved.—7. Red.

SOIL AND SITUATION.

A dry, moderately fertile soil, is best suited to their growth, in a rather sheltered situation. If the soil is rich, or superabounding in moisture, they grow luxuriantly, but are apt to perish in winter. If the situation is very open, they are more apt to grow ragged and stunted.

TIMES AND MODES OF PROPAGATION.

They are propagated by cuttings of the young shoots from the sides of the branches, sometimes also by rooted offsets, and likewise by seed.

BY CUTTINGS.

The cuttings may be either of the preceding or same year's growth: if of the first, they may be planted in April, but of the latter, not until the close of May or middle of June. The shoots of the same year are usually employed, as they more readily emit roots, and assume a free growth. The outward and most robust shoots should be chosen, and cut from five to seven inches in length. All but the top leaves being removed, they must be inserted by the dibble almost down to these, in rows six inches apart each way. A shady border should be allotted them, and moist weather taken advantage of to insert them; otherwise water must be given immediately, and repeated occasionally until they have taken root. When the plants thus raised have an appearance of spindling, or run up to flower, they are to be topped short, to induce the

emission of laterals. In the autumn, if they have attained a tolerable shrubby growth, otherwise not until the succeeding spring, they may be removed to their final stations; being taken up with as little injury as possible to the roots, and planted, if in a bed, in rows eighteen inches apart each way.

BY OFFSETS.

When there are rooted offsets, they may be slipped off separately, with their fibrous roots still pertaining, or the whole plant may be taken up and divided into as many separate slips as can be furnished with roots. These may be planted both in the spring and autumn, but the first season is to be preferred. They are to be set out at once where they are to remain.

BY SEED.

If raised from seed, which, although seldom done is the most preferable mode, inasmuch as that the plants afford fine-flavoured, larger, and greater abundance of leaves. It must be sown in April, in a bed of rich, light earth, broadcast, and lightly raked in. The plants soon make their appearance and, when two or three inches high, they must be thinned to half a foot apart, and those removed pricked out at a similar distance. In the autumn, or succeeding spring, according as the plants are strong or weak, they are to be removed to their final stations, the roots being disturbed as little as may be.

AFTER-CULTURE.

During their future existence, they must be kept constantly clear of weeds. The decayed flower-stalks, stunted branches, &c., removed in early winter and spring, and the soil of the beds slightly turned over. All irregular growth may be corrected during the spring and summer. When the plants have con-

tinued two or three years, a little dry, well-putrified dung may be turned in during early spring with considerable advantage. A due attention to the mode of gathering has no small influence in keeping the plants healthy and vigorous. The tops ought never to be cropped too close, so as to render the branches naked or stumpy. This should be especially attended to in autumn and winter. During this last season, they are less liable to be injured by severe frost, if kept with a full regular head. If appearance is considered, fresh plants must be raised every three or four years, as the old ones become ragged and stunted from continued cropping during that period. For drying, the shoots and leaves may be gathered any time in summer, before the plants flower, which they do in July.

TO OBTAIN SEED.

For the production of seed, two or three of the finest plants of two years' growth must be left not nearer to each other than four feet. Weeds are to be constantly cleared away, and, when the plants begin to flower, a plentiful watering given, and repeated every other day until the seed has attained its full growth. When perfectly ripe, the plants being pulled up, and completely dried, they easily shed their seed if struck upon the floor.

SCANDIX CERIFOLIUM.—PARSLEY-LEAVED CHERVIL.

SCANDIX ODORATA.—FERN-LEAVED CHERVIL.

For soups, salads, &c., they are still cultivated by the Dutch, but in this country they are not often found in the kitchen garden.

SOIL AND SITUATION.

The soil for these plants must be mouldy, and containing a portion of calcareous matter: it need not be very poor, yet far from rich; and although the soil need not be so light or dry as for "savory," yet it must have an open subsoil, and be free from any superabundant moisture. The situation cannot be too open, but a shelter from the meridian sun is of great importance.

TIMES AND MODES OF SOWING.

Seed may be said to be the only means of propagation, and the only sowing of this that can be depended upon must be performed in early autumn, immediately after it is ripe; for if kept until the following spring, it will seldom germinate, or if this first grade of vegetation does take place, the seedlings are generally weak, and die away during the hot weather. If, however, it should fortunately retain its vegetative powers, it may be sown during February and the three following months, at intervals of four weeks, for use in spring and summer, and towards the end of July for autumn supply.

The seed may be sown in drills eight inches apart,

or broadcast, in either mode being only just covered. The plants are to be thinned to eight inches asunder, and to remain where they are raised. The only after-cultivation required by them is to be kept clear of weeds. The perennial sort must be trimmed as directed for "Sage." The leaves are fit to be gathered when from two to four inches in growth; in doing which, they should be cut close, when the plants will shoot afresh.

TO OBTAIN SEED.

For the production of seed, some of the autumn-raised plants of the annual species must be left ungathered from. They flower in April, and ripen their seed about June. Of the perennial species, some must in a like manner be left untouched: they will flower about June, and ripen their seed in July or August.

SINAPIS.

From σιναπι, on account of its making the eyes water, σινει ωπας.

SINAPIS ALBA.—WHITE MUSTARD.

SINAPIS NIGRA.—BLACK MUSTARD.

The first is the one grown for salads, but the seed of both is employed in the manufacture of mustard.

SOIL AND SITUATION.

The soil they succeed in best, is a fine rich mouldy loam, in which the supply of moisture is regular: it may much rather incline to lightness than tenacity.

If grown for salading, it need not be dug deep, but if for seed, to full the depth of the blade of the spade. In early spring and late in autumn, the situation should be sheltered, and, during the height of summer, shaded from the meridian sun.

TIMES AND MODES OF SOWING.

For salading, the white may be sown throughout the year. From the beginning of November to the same period of March, in a gentle hot-bed appropriated to the purpose, in one already employed for some other plant, or in the corner of a stove. From the close of February to the close of April, it may be sown in the open ground on a warm sheltered border, and from thence to the middle of September, in a shady one. Both the white and black, for seed, may be sown at the close of March, in an open compartment.

For salading, it is sown in flat-bottomed drills, about half an inch deep and six inches apart. The seed cannot well be sown too thick. The mould which covers the drills should be entirely divested of stones. Water must be given occasionally in dry weather, as a due supply of moisture is the chief inducement to a quick vegetation. The sowings are to be performed once or twice in a fortnight, according to the demand. Cress (*Lepidium sativum*) is the almost constant accompaniment of this salad herb; and as the mode of cultivation for each is identical, it is only necessary to remark, that, as Cress is rather tardier in vegetating than Mustard, it is necessary for the obtaining them both in perfection at the same time, to sow it five or six days earlier.

It must be cut for use whilst young, and before the rough leaves appear, otherwise the pungency of the flavour is disagreeably increased. If the top only is

cut off, the plants will in general shoot again, though this second produce is always scanty, and not so mild or tender.

TO OBTAIN SEED.

For the production of seed, whether for the manufacture of Mustard, or future sowing, the insertion must be made broadcast, thin and regularly raked in. When the seedlings have attained four leaves, they should be hoed, and again after the lapse of a month during dry weather, being set eight or nine inches apart. Throughout their growth they must be kept free from weeds, and if dry weather occurs at the time of flowering, water may be applied with great advantage to their roots. The plants flower in June, and are fit for cutting when their pods have become devoid of verdure. They must be thoroughly dried before threshing and storing.

FORCING.

For forcing, the seed is most conveniently sown in boxes or pans, even if a hot-bed is appropriated to the purpose. Pans of rotten tan are to be preferred to pots or boxes of mould. But whichever is employed, the seed must be sown thick, and other restrictions attended to, as for the open-ground crops. The hot-bed need only be moderate. Air may be admitted as abundantly as circumstances will allow.

SYSIMBRIUM.

SYSIMBRIUM NASTURTIUM.—WATER CRESS.

It was seldom admitted as an object of cultivation, and then never to any extent, until Mr. Bradberry, of West Hyde, Herts, undertook its cultivation for the London market: and as his practice is founded not only upon just principles, but also long experience, the following directions are chiefly extracted from his; all others that I have seen having been imperfeet, and some so completely erroneous, as not possibly to be productive of healthy crops.

VARIETIES.

Mr. Bradberry considers that there are three varieties—the Green-leaved, which is easiest cultivated; Small Brown-leaved, which is hardiest; and the Large Brown-leaved, which is the best, having most leaf in proportion to the stalk, and is the only one that can well be cultivated in deep waters*.

The plants thrive best in a moderately swift stream, about an inch and a half deep, over a gravelly or chalky bottom, and the nearer its source the better: when there is choice, such situations, therefore, should be exclusively planted. If mud is the natural bottom, it should be removed, and gravel substituted. The plants are to be set in rows, which is most conducive to their health and good flavour, inasmuch as that they are regularly exposed to the current of water, of which, if there is not a constant

* Trans. Hort. Soc. Lond., vol. iv. p. 538.

stream, they never thrive. In shallow water, as above-mentioned, the rows may be made only eighteen inches apart, but in deeper currents, from five to seven feet are sometimes necessary. The beds must be cleared and re-planted twice a year, for in the mud and weeds which quickly collect, the plants not only will not grow freely, but it is difficult to separate them in gathering; it is likewise rendered imperative by the heads becoming small from frequent cutting.

The times for planting and renewal are in successional insertions during May and June, the plants from which will come into production in August; and again from September to November, those in the last month being ready in the spring.

In renewing the plantations, the bed of the stream, commencing towards its head, being cleared of mud and rubbish, from the mass of plants taken out, the youngest and best rooted must be selected. These are returned into the stream, and retained in their proper order, by a stone placed on each. After the plants have been cut about three times, they begin to stock, and then the oftener they are cut the better. In summer they must be cut very close. The situation being favourable, they will yield a supply once in a week. In winter the water should be kept four or five inches deep; this is easily effected, by leaving the plants with larger heads, which impedes the current. The shoots ought always to be cut off; breaking greatly injures the plants *.

Where water of considerable depth alone is at command (though shallows may in general be obtained, as Mr. Bradberry did, by cutting away the banks of a stream, and spreading its waters), in such it would undoubtedly be useless to attempt the

* Trans. Hort. Soc. Lond., vol. iv. p. 537—42.

above mode of cultivation. But here this wholesome plant may be introduced by retaining some plants at the bottom by means of stones. They soon find their way to the surface, where they ripen their seeds about July, which sinks, when perfected, to the bottom, and vegetates without further care. In such a situation, some plants must every year be allowed to vegetate undisturbed.

SOLANUM.

From sols, solans, *to make absolute ; on account of its lurid appearance and poisonous qualities.*

SOLANUM TUBEROSUM.—POTATO.

VARIETIES.

The varieties are numerous, and continually increasing, as well as becoming extinct; the number, however, is very largely increased by local names for the same variety being classed distinct.

For forcing, or first crop in the open ground:—

Broughton Dwarf — Early Warwick — Ash-leaved Kidney.
Fox's Seedling — Early Manly — Early Mule — Earliest, for general cultivation.
Early Kidney.
Nonsuch.
Early Shaw.
Goldfinder.

For main crops, the varieties are ranged in this class, according to their forwardness in ripening:—

Early Champion.
Ox Noble.

Red Nose Kidney.
Large Kidney.
Bread Fruit.
Red-streak, or Lancashire Pink Eye.
Black Skin.
Purple.
Red Apple.
Rough Red.

SOIL AND SITUATION.

No inhabitant of the garden varies more in quality in different gardens than the potato; for a variety will have a strong unpleasant flavour in one soil, that has a sweet agreeable one in another. In a heavy, wet soil, or a rank, black loam, though the crop is often fine and abundant, it is scarcely ever palatable. Siliceous soils, even approaching to gravel, though in these last the tubers are usually corroded or *scabby*, are always to be planted in preference to the above. A dry, mouldy, fresh, and moderately-rich soil is unquestionably the best for every variety of the potato; and, for the earliest crop, it may be with advantage more siliceous than for the main ones. The Black-skinned and Rough Red thrive better than any in moist or strong cold soils. If manure is necessary, whatever may be the one employed, it is better spread regularly over the surface previous to digging, rather than put into the holes with the sets, or spread in the trench when they are so planted. Stable-dung is, perhaps the best of all factitious manures: sea-weed is a very beneficial addition to the soil, as is salt. Coal-ashes and sea-sand are applied with great benefit to retentive soils; but calcareous matter should never be used. The situation must always be open.

TIMES AND MODES OF PROPAGATION.

It is propagated in general from cuttings of the tubers, though the shoots arising from thence and layers of the stalks may be employed. New varieties are raised from seed.

Planting in the open ground of the early kinds may commence towards the close of February, in a warm situation, and may thence be continued until the same period of March; and it is only during this latter month that any considerable plantation should be made, as the late frosts are apt to injure, or even destroy the advancing plants. In the course of April, the main crops for winter's use should be inserted; for although in favourable seasons they will succeed if planted in May or even June, yet it ought always to be kept in mind that the earliest planted, especially in dry soils, produce the finest and most abundant crops.

SETS.

The next point for consideration is, the preparation of the sets. On this there is a great diversity of opinion. Some gardeners recommend the largest potatoes to be planted whole; others, these to be sliced into pieces, containing two or three eyes; a third set, to cut the large tubers directly in half; a fourth, the employment of the shoots only which are thrown out, if potatoes are kept in a warm, damp situation; and a fifth, that merely the parings be employed. Cuttings of the stalks, five or six inches in length, or rooted suckers, will be productive, if planted during showery weather in May or June; and during this last month, or early in July, it may be propagated by layers, which are formed by pegging down the young stalks when about twelve inches long, they being covered three inches thick with mould at a

joint. These three last modes are practised more from curiosity than utility, whilst at the same time none of the first five mentioned plans can be individually followed to advantage, without modification. For the main crops, it is evident, from experiment, that moderate sized sets, having two healthy buds or eyes, are most advantageously employed; middling sized whole potatoes are the best, from which all but the above number of eyes have been removed, but especially having *the crown,* which is a congeries of small eyes always present, first removed; for from these proceed an equal number of little spindled stalks, which are comparatively worthless, and injure the main stem.

For the early crops, almost the very contrary to the above is the most advantageous to be practised. The set should have *the crown eye,* which is one growing in the centre of the congeries of small ones above mentioned, preserved. Some potatoes have two such eyes, but the generality only one. This is always the most prompt to vegetate; and if not known by this description, may be evinced by placing two or three potatoes in a pan of moist earth, near the fire; if the earth is kept moist, the crown eye will be in a state of vegetation in five or six days *. Again, as President Knight remarks, although abundant crops of late varieties may be obtained from very small sets, by reason that tubers are not produced until the stem and roots become capable of supplying them with nourishment; yet, to obtain early crops, where tubers are rapidly formed under a diametrically opposite state of the plant, large sets must be employed; in these, one or two eyes, at most, should be allowed to remain. Mr. Knight plants the largest

* Pract. Treat. on the Culture of the Potato, p. 20.

undivided tubers, which from experiments, evidently support the plants, and finally produce the earliest and largest produce he ever obtained. Another remark, which he makes, restrictively for the early crops, but may well be attended to for all, is, that if the sets are placed with their leading buds upwards, few and very strong early stems will be produced; but if the position is reversed, many weak and later shoots will arise, and not only the earliness, but the quality of the produce be depreciated *. For the earliest crops, there are likewise several modes of assisting the forward vegetation of the sets. These should be prepared in November, by removing every eye but one or two; and being placed in a layer, in a warm room, where air and light can be freely admitted, with a covering of straw, they soon emit shoots, which must be strengthened by exposure to the air and light as much as possible, by taking off the covering without injuring them. During cold weather, and at night, it must always be renewed. The leaves soon become green, and tolerably hardy. In early spring they are planted out, the leaves being left just above the surface, and a covering of litter afforded every night, until the danger of frost is passed. The only modification of this plan that is adopted in Cheshire, where they are celebrated for the early production of potatoes, is, that they employ chaff or sand for a covering instead of straw †.

PLANTING.

The most preferable mode of inserting them, is with the dibble, in rows, for the early crops, twelve inches apart each way; and for the main ones,

* Trans. Hort. Soc. Lond., vol. iv. p. 448.
† Holland's Agricult. Survey of Cheshire.

eighteen. The sets should never be placed more than four inches beneath the surface in the lightest soil, but in the more tenacious ones, three is the extreme. The potato dibble is the best instrument that can be employed; one person striking the holes, and a second dropping the sets, the earth being afterwards raked, or struck in with the spade. There are several other modes of insertion, as opening a small hole with a narrow spade, and the set being dropped in, it is covered by the earth taken out in forming the next hole: or, at the time of digging over the ground, a second person follows the one so employed, and places the sets in the trench he opens in the pursuance of his work; but both these modes are open to numerous obvious objections.

The compartment may be laid out level and undivided, if the soil is mouldy and favourable; but if a heavy one is necessarily employed, it is best disposed in beds, six or eight feet wide. If the staple of the soil is good throughout, the alleys may be two feet wide, and dug deep, otherwise they must be made broader, and only one spit taken out, the earth removed being employed to raise the beds. If the land is low and wet, it is still further of advantage, after the beds, which should not be more than four feet wide, have been thus raised, if they are dug in parallel ridges, and the sets inserted along their summits. Some gardeners, on such soils, without digging the surface, lay some long litter on the intended beds; upon this the sets being placed, some more litter is thrown regularly over them; the earth is then dug from the alleys, and turned to the requisite depth over the whole.

HOEING.

As soon as the plants are well to be distinguished, they should be perfectly freed from weeds; and, of

the early crops, the earth drawn round each plant, so as to form a cup, as a shelter from the cold winds, which are their chief enemy at that season; but the main crops need not be earthed up until the plants are six inches in height. It is contended by some that this practice is immaterial in its effect *. If the earth is brought so as to be of considerable depth about the stems, it must be even injurious, but if properly performed it is certainly beneficial. Throughout their growth they should be kept perfectly clear of weeds. It is very injurious to mow off their tops, as is sometimes recommended. The foliage ought to be kept as uninjured as possible, unless, as sometimes occurs on fresh ground, the plants are of gigantic luxuriance, and even then, the stems should be only moderately shortened. It is, however, of considerable advantage to remove the fruit stalks and immature flowers as soon as they appear. This has been demonstrated by the experiments of President Knight, and others; indeed, that such would be the case is a reasonable expectation, since it is known that the early formation of tubers prevents the production of blossom †. It is also worthy of notice, that a potato plant continues to form tubers until the flowers appear, after which it is employed in ripening those already formed.

The very earliest crops will be in production in June, or perhaps towards the end of May, and may thence be taken up as wanted, until October, at the close of which month, or during November, they may be entirely dug up and stored; or, at all events, before the arrival of any severe frost. Their fitness to be taken up for keeping is intimated by the decay of their foliage,

* Bath Papers, vol. i. p. 28.
† Trans. Hort. Soc. Lond., vol. i. p. 188.

which generally loses its verdure with the first frosts. The best instrument with which they can be dug up, is a three-flat-pronged fork, each row being cleared regularly away. The tubers should be sorted at the time of taking them up; for as the largest keep the best, they alone should be stored, whilst the smaller ones are first made use of. The most common mode of preserving them throughout the winter is in heaps or clamps, sometimes called *pyeing* them. These are laid in pyramidal form, on a bed of straw, and enveloped with a covering, six or eight inches thick, of the same material, laid even, as in thatching, and the whole enclosed with earth, in a conical form, a foot thick, taken from a trench dug round the heap, well smoothened with the back of the spade. Potatoes should not be stored until perfectly dry, nor unless free from mould, refuse, and wounded tubers. It is a good practice to keep a hole open on four different sides of the heap, entirely through the mould and straw, for a week or two after the heap is formed; for in proportion to its size it always ferments, and these orifices allow the escape of the vapours, and perfect the drying. An equally good mode, and much more convenient, is to have them heaped in a dry shed, and covered thick with straw, as opportunity is given to look over them occasionally for the removal of decayed tubers, shoots, &c. If carefully preserved they continue in perfection until late in the following summer.

TO RAISE VARIETIES.

A variety of the potato is generally considered to continue about fourteen years in perfection, after which period it gradually loses its good qualities, becoming of inferior flavour and unproductive. Fresh varieties must therefore be occasionally raised from seed. For doing this there are two modes; the first

of these, about to be detailed, is, however, the one usually pursued.

The berries or apples of the old stock having hung in a warm room throughout the winter, the seed must be obtained from them by washing away the pulp during February. This is thoroughly dried, and kept until April, and then sown in drills about half an inch deep, and six inches apart, in a rich mouldy soil. The plants are weeded, and earth drawn up to their stems when an inch in height; as soon as this has increased to three inches, they are moved into a similar soil, in rows, sixteen inches apart each way, and during their future growth earthed up two or three times. Being finally taken up in the course of October, they must be preserved until the following spring, to be then replanted, and treated as for store crops *.

Some gardeners sow in a moderate hotbed, very thin, in drills, the same depth as above, and nine inches apart. Water is frequently and plentifully poured between the rows, and earth drawn about the stems of the seedlings, until they are a few inches in height. They are then transplanted into rows, water given, and earthing performed as usual. The only additional advantage of this plan is, that as the seed can be sown earlier, the tubers attain a rather larger size the first year.

It is to be remarked, that the tubers of every seedling should be kept separate, as scarce two will be of a similar habit and quality, whilst many will be comparatively worthless, and but few of particular excellence. If the seed is obtained from a red potato, that flowered in the neighbourhood of a white tubered variety, the seedlings in all probability

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* Dr. Hunter's Georg. Essays.

will in part resemble both their parents, as a cross fecundation may take place; but seldom or never does a seedling resemble exactly the original stock. At all events, only such should be preserved as are recommended by their superior size, flavour, or fertility. It may be stated as an indication before these qualities can be positively ascertained, that President Knight remarks, that the rough uneven surface of the foliage, which in excess constitutes the curl, appears to exist as and form a characteristic of every good variety, for he never found one with perfectly smooth and polished leaves which possessed any degree of excellence, though such are in general more luxuriant and productive *.

The early varieties, on account of their never flowering, were, until 1807, obtained by chance from plants that might now and then be produced from seed of the late kinds. In that year, President Knight discovered that the cause of their deficiency of bloom was the preternatural early formation of the tubers. His mode of causing them to produce seed is to plant the sets on little heaps of earth, with a stake in the middle, and when the plants are about four inches high, being secured to the stakes with shreds and nails, to wash the earth away from the bases of the stems, by means of a strong current of water, so that the fibrous roots only enter the soil, and these being perfectly distinct from the runners that furnish the tubers, and which spring from the base of the stem, none of these are produced, and the effect is, that blossoms appear and perfect seed †.

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* Trans. Hort. Soc. Lond., vol. ii. p. 64.
† Ib. vol. i. p. 58.

FORCING.

The season for forcing is from the close of December to the middle of February, in a hot-bed, and at the close of this last month on a warm border, with the temporary shelter of a frame.

The hot-bed is only required to produce a moderate heat. The earth should be six inches deep, and the sets planted in rows six or eight apart, as the tubers are not required to be large.

The temperature ought never to sink below 65° or rise above 80°.

The rank steam arising from fermenting dung is undoubtedly injurious to the roots of potatoes; and, to obviate this, they may be planted in narrow beds, and the dung applied in trenches on each side, as Mr. Baldwin recommends for the *Crambe maritima*, The plan of forcing adopted by Mr. Hogg also obviates the difficulty. All the earth from an old cucumber or other hot-bed being removed, and an inch in depth of fresh put on, he plants his sets and covers them with four inches of mould. At the end of five days, the sides of the old dung are cut away in an inward slanting direction, about fifteen inches from the perpendicular, and strong linings of hot dung applied *.

If the tubers are desired to be brought to maturity as speedily as possible, President Knight says that, instead of being planted in the earth of the bed, each set should be placed in a pot about six inches in diameter; otherwise the former situation is preferable, as the produce in pots is smaller †.

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* Trans. Hort. Soc. Lond., vol. ii. p. 144.
† Ib. vol. i. p. 211.

PREPARATION OF SETS.

The next point for consideration is the preparation of the sets. They should be of the varieties enumerated for the purpose of forcing, or any other that may have the habit of vegetating before Christmas. To assist their forward vegetation, Professor Knight plants a single potato in each of the pots intended for forcing. During January, these are placed in the ground and protected with litter from the frost: this renders them very excitable by heat, and, consequently, when plunged in a hot-bed, they vegetate rapidly, and generate tubers. The Seed Potatoes are equally assisted, and with less trouble, if placed in a cellar just in contact with each other, and, as soon as the germs are four inches long, removed to the hot-bed*.

MANAGEMENT.

More than one stem should never be allowed to rise from a stool; for, where more are allowed, the tubers are smaller, and not more numerous. Water must be given whenever the mould appears dry, and in quantity proportionate to the temperature of the air. Linings must be applied as the temperature declines. Air must be admitted as freely as the temperature of the atmosphere will allow, and with due precautions. Coverings must be afforded with the same regard to temperature. From six to seven weeks usually elapse between the time of planting and the fitness of the tubers for use. The average produce from a light is about five pounds.

There is another mode of obtaining young potatoes

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* Trans. Hort. Soc. Lond., vol. i. p. 212.

during the winter, which is much practised on account of its facility, though being produced without foliage they are not so fine in flavour, are deficient in farina, and are otherwise inferior. Old potatoes often throw out from their sides young ones, early in the spring, and of this habit advantage is taken in obtaining them still earlier. Sound full-grown and ripe tubers, of the Oxnoble variety, that have no appearance of vegetating, must be laid alternately with layers of perfectly dry rich vegetable mould, four inches deep, in pans or boxes, until they are filled. These may be placed in a thoroughly dry shed, or on a shelf in the kitchen. If the layers are constructed in the corner of a shed or cellar, the produce will be equally good, though longer in coming to perfection. No foliage is produced; the potatoes soon are surrounded by numerous young ones of moderate size. No water must ever be admitted on any account. Notice is to be taken that between three and four months elapse between the time of forming the layers and the fitness of the produce for use. Thus, if made early in September, the crop will be ready in the course of December. When they are examined, those that are fit may be taken off, and the old potatoes replaced until the remainder are ready. By pursuing this plan every month, a regular supply may be kept up throughout the year*. Dr. Noehden, vice Secretary to the London Horticultural Society, informs us that young potatoes may be preserved for months, in a state as good as when first taken from the ground; for burying them in an unfertile medium, as sand, has not the least tendency to promote their maturity.

* Mawe's Append. to Abercrombie's Gard. p. 678. Trans. Hort. Soc. Lond., vol. i. p. 235, and vol. iii. p. 48—58.

SOLANUM LYCOPERSICUM.—LOVE APPLE OR TOMATO.

VARIETIES.

There are two species of the Tomato at present in cultivation in this country — the red-fruited and the yellow-fruited. A white species is mentioned by many old horticultural writers, but this, together with many varieties noticed by them, appears now to be lost. Of each of the above, there are several sub-varieties, chiefly differing in the size and shape of their fruit. Of them all, the most esteemed is the common large red, though for pickling some of the smaller fruited varieties are preferable. The following is chiefly condensed from a description of them by Mr. Sabine, Secretary of the Horticultural Society.

Of the Red there are—

1. The Common Large.
2. Small.
3. Pear-shaped.
4. Cherry-shaped.

Of the Yellow there are—

1. The Large Yellow.
2. Small or Cherry Yellow.

SOIL AND SITUATION.

The soil best suited to it is rich, light, and mouldy, in a dry subsoil; for although a regular supply of moisture is a chief requisite, yet stagnant water is very injurious. Sea-weed may be applied with advantage to the border on which it is grown, as may

kelp or common salt in small quantities. The situation must be sheltered; but this point will be more insisted upon as we proceed. See also "Capsicum."

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown at the close of March or early in April, in a hot-bed or stove, which latter is to be preferred. The hot-bed must be of a moderate durability, earthed about six inches deep. The sowing must not be performed until the requisite time has elapsed for guarding against the danger of a violent heat arising. If a hot-house is employed as the nursery of the seedlings, the seed must be sown in pots or boxes set on the flues or round the edges of the pits.

In whatever situation sown, the seed must be scattered thin, and not buried more than half an inch below the surface. The plants are not long in appearing; when of two or three weeks' growth, in which time they acquire a height of as many inches, they must be thinned to three inches apart, and those removed, if wanted, pricked at the same distances, in a similar bed to that from which they may be removed, shade and water being afforded as may appear necessary. Air must be afforded freely in every stage of their growth; for if, from the want of this, a due exposure to the light, or any other cause, theybecome spindling and weak, they seldom or never are productive. Their removal into the open air and their final situation must not take place until May or early June, according to the geniality of the season. To prepare them for this, the heat of the hot-bed should be allowed gradually to decline; or if in a hot-house, the pots may by degrees be removed into its cooler parts, until at length they can endure the temperature of the green-house, where they may be

kept until finally moved. But before that time arrives, another thinning will be requisite; those in the hot-bed to six inches apart, and those in the stove, each plant separate into tolerable sized pots.

They are to be finally planted five feet apart, beneath a south paling or wall, to which their branches must be trained; for if allowed to trail on the ground, the fruit scarce ever ripens, and never is in perfection. The transition is rendered less sudden if planted over holes filled with hot dung, earthed over eight inches deep. They ought never to be planted very near fruit trees, as they are particular impoverishers of the soil. The removal should be accomplished with as little disturbance as possible to the root, and for effecting this their being in pots is eminently advantageous. Water and shade during mid-day must be afforded until they are established; and if the nights are cold during the first week or two, or the weather tempestuous, the shelter of a hand-glass, or even of an inverted garden-pot, is advantageously afforded. The training may commence as soon as the branches are a foot long, and continued throughout their growth. If the plants are strong, an horizontal direction is best; if weak, a more upright one. In case of a want of space of wall or paling, they may be trained with stakes as espaliers, but much rather on sloping banks of earth, which is the practice of Mr. J. Wilmot, of Islington: upon these they are pegged down, and, striking root from their joints, often support themselves*. It would be an improvement to cover the banks with slates or tiles.

Care must be taken throughout the summer to clear away all lateral shoots, as well as to thin the

* Trans. Hort. Soc. Lond., vol. iii. p. 345.

leaves so as to expose the fruit to the full influence of the sun.

The berries begin to ripen about the middle of August, and continue to do so until October, or the arrival of the first frosts, which always destroys the plants.

TO OBTAIN SEED.

For producing seed, some of the forwardest berries must be left until perfectly ripe. It must be separated from the pulp by washing, as directed for the "Cucumber."

SPINACEA.

From Spina, *on account of its prickly seed.*

SPINACEA OLERACEA.—SPINACH.

VARIETIES.

There are two varieties—the round-leaved or smooth-seeded, and the triangular-leaved or prickly-seeded. The first being the most succulent, and, consequently, less able to endure a low degree of temperature, is employed for the spring and summer crops, and the latter for autumn and winter.

SOIL AND SITUATION.

For the round-leaved variety, a rich moist and mouldy loam, in an open situation, is preferable; but for the triangular-leaved a light moderately fertile and dry one, which may likewise be an open compartment, but a sheltered border is most conducive of a continued supply throughout the winter.

The earth should always be well pulverised at the time of digging, as a fine tilth is one of the greatest inducements to its vigour.

TIMES AND MODES OF SOWING.

It is propagated by seed. The first sowing of the round-leaved variety may take place at the close of January, in a warm situation, to be repeated in larger but still small breadths at the commencement and end of February, and thence to be continued, as the plants rapidly advance to seed, every three weeks until the middle of April, when, as this affection increases, it must be performed once a week until the close of May, when it may be reduced to once a fortnight, and so practised until the end of July. With August, the sowing of the triangular-leaved variety commences, the main crop of which should be sown during the first ten days of that month. The sowing may be repeated after intervals of three weeks, until the early part of September.

The sowings may be performed broadcast and regularly raked, and which is the mode generally practised for the principal crops, and for the winter standing always, or in drills an inch deep and a foot apart; in either mode the seed being scattered thin. If possible, the sowing should be performed in showery weather, otherwise an occasional watering must be given; for if there is a deficiency of moisture during the first grades of vegetation, not half of the seedlings will come up. When sown broadcast, the beds should not be more than three or four feet wide, otherwise the weeding, &c., is very inconvenient.

If grown in drills, the plants may stand close; but when broadcast, the triangular-leaved plants must be thinned to four or five inches apart, and the round-leaved to eight. The thinning should be performed by degrees, separating them at first only an inch or

two, as the plants of the several thinnings are fit for use. The thinning ought to commence when they have attained four leaves about an inch in breadth.

Nothing tends more to the vigorous growth of spinach than its being kept constantly clear of weeds. To effect this, it should be hoed frequently at intervals, and, if possible, during dry weather. In wet seasons, the large weeds should be taken away by hand previous to the hoeing. Winter spinach, if encumbered with weeds, or growing too thick, is very apt to decay. Regular gathering is another means of promoting the health of the plants. The outer leaves only should be gathered at a time, the centre being left uninjured, to produce successional crops. This direction applies chiefly to the winter standing crops: those of the summer may be cut off close to the root. The gathering from the winter variety commences in October or November, and continues throughout the winter. At the end of this season, on a dry day, the earth should be gently stirred, which will assist their production in early spring.

TO OBTAIN SEED.

For the producing of seed, a sowing of both varieties may be performed in February or March, according to the openness of the season; or of the round-leaved variety some plants of a regular crop may be allowed to run up in April or May; and of the triangular-leaved some plants of the winter-standing crops may be transplanted in March. The same care is required in keeping them clear of weeds. They must be set twelve inches apart. Spinach is diœcious, and many ignorant persons, perceiving some of the plants to have no appearance of bearing seed, advise these to be pulled up. In the present diffused

state of botanical knowledge, it is almost needless to remark, that these are the male bearing plants, without which the others would be unfruitful. If, however, they are very numerous, some of them may be removed with benefit to those that remain, care being taken that some are left in every part of the bed. When the seed is set, they may be entirely removed, which allows more room for the fruitful ones. When the seed is ripe, and which is known by its beginning to shed in July or August, the plants ought to be pulled up and laid to dry thoroughly on a cloth previous to its being beaten out and stored.

TANACETUM.

From Αθανασια, *immortality, from its sanative qualities, or its extreme hardihood.*

TANACETUM VULGARE.—TANSEY.

VARIETIES.

There are three varieties—the curled or double Tansey, which is the one chiefly grown for culinary purposes; the variegated; the common or plain. This last is but of little worth, except for medicinal preparations.

SOIL AND SITUATION.

It will grow almost in any soil or situation. A light, dry, and rather poor soil, in an open exposure, is best suited to it, as in such it is the most hardy and aromatic.

TIMES AND MODES OF PLANTING.

It is propagated by rooted slips, or divisions of its fibrous creeping root, which may be planted from the close of February until that of May, as well as during the autumn. Established plants may be moved at any period of the year. It is inserted in rows twelve inches apart each way; a gentle watering being given, if the season is not showery. As the roots spread rapidly, plants will soon make their appearance over a large space of ground if left undisturbed; to prevent it, a path should be left entirely round the bed, and often dug up to keep them within bounds. The plants run up to seed during summer, but the stalks must be constantly removed, to encourage the production of young leaves. Weeds should be as carefully extirpated, and the decayed stalks cleared away in autumn, at the same time a little fresh mould being scattered over the bed.

FORCING.

If required during the winter and early spring, old undivided roots must be placed in a moderate hot-bed once a month, from the middle of November to the close of February. They may be planted in the mould of the bed, in pots, and plunged in a similar situation, or placed round the edges of the bark pits in a hot-house. A frame is not absolutely necessary, as a covering of mats, supported on hoops, afforded during frost, at night, and in very inclement weather, will answer nearly as well.

TETRAGONIA.

TETRAGONIA EXPANSA. — TETRAGONIA OR NEW ZEALAND SPINACH.

It is much admired as a substitute for summer spinach, being of more delicate flavour, and not so liable to run to seed. I am indebted to Mr. J. Anderson, gardener to the Earl of Essex, at Cassiobury, Herts, for the following directions for its cultivation.

It is propagated by seed, which is sown, in the seed-vessel, as gathered the preceding autumn, at the latter end of March, in a pot, and placed in a melon frame. The seedlings to be pricked while small, singly into pots, to be kept under a frame without bottom heat until the third week in May, or until the danger of frost is past. The bed for their reception is formed by digging a trench two feet wide and one deep, this being filled with thoroughly decayed dung, and covered six inches deep with mould. A space of at least three feet must be left vacant on each side, measuring from its centre to allow for the extension of the branches. Twenty plants will afford an abundant supply daily for a large family: they must be planted three feet apart. In dry seasons they probably require a large supply of water. In five or six weeks after planting, the young leaves may be gathered from them, these being pinched off. The leading shoot must be carefully preserved, for the branches are productive until a late period of the year, as they survive the frosts that kill nasturtiums and potatoes.

TO OBTAIN SEED.

For the production of seed, a plantation must be made on a poorer soil, or kept stunted and dry in pots, as ice plants are when seed is required of them. On the rich compost of the bed the plants become so succulent as to prevent the production of seed*.

THYMUS.

From θυμος, courage, being considered a reviver of the spirits; or from θυω, to sacrifice, being employed as incense.

THYMUS VULGARIS.—GARDEN THYME.

VARIETIES.

The varieties are — the Broad-leaved Green; Narrow-leaved Green; Variegated; and Lemon-scented. The Variegated is grown almost solely on account of its ornamental foliage.

SOIL AND SITUATION.

A poor, light, and dry soil is best suited to it. In moist or rich ones, it becomes luxuriant, but deficient in its aromatic qualities, and generally perishes during the winter. The situation cannot be too open.

TIME AND MODE OF PROPAGATION.

It is propagated both by seed and rooted slips. Sowing may be performed from the middle of March

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* Trans. Hort. Soc. Lond., vol. iv. p. 488—494.

until about the beginning of May. Slips may be planted from the beginning of February until the close of May.

The seed must be sown neither thick nor raked in more than half an inch below the surface. It is sometimes sown in drills of a similar depth, six inches apart, or as an edging to a bed or border. The seedlings must be kept clear of weeds, and, if the season is dry, watered moderately twice a week. When of about six weeks' growth, or when three or four inches high, they require to be thinned to six inches apart, unless grown as an edging, when they must be left thick. Those removed may be pricked out at a similar distance if required. Water is required occasionally until they have taken root. The plants may be left in the situations they are placed in at this season, or be finally planted out in September or October, or in the early spring of the following year. To obtain slips, some old stools may be divided into as many rooted portions as possible, or layers may be obtained by loosening the soil around them, and pegging the lateral shoots beneath the surface. They must be planted out at distances similar to those raised from seed, water and weeding being similarly required.

In autumn the decayed stalks should be cleared, and a little fresh earth scattered and turned in among the stools.

Although it is perennial, yet after three or four years it becomes stunted and unproductive, consequently requiring to be raised periodically from seed.

TO OBTAIN SEED.

For the production of seed, some plants should be allowed to run up without being gathered from

in early summer. The seed is ripe during July, and must be cut immediately it is so, and laid on a cloth to dry, otherwise the first rain will wash it out of the seed-vessel.

TROPÆOLUM.

Diminutive of tropæum, *a* trophy.

TROPÆOLUM MAJUS.—MAJOR NASTURTIUM, OR INDIAN CRESS.

TROPÆOLUM MINUS, OR INDIAN CRESS.

Although they are strictly annual when grown in the open ground in this country, yet they are naturally perennial, as may be proved, if they are grown in a greenhouse. The Major Nasturtium being the most productive, as well of flowers and leaves as of berries, is the one that is usually cultivated in the kitchen garden, the two first being employed in salads and for garnishing, and the last in pickling.

SOIL AND SITUATION.

They will flourish in almost any soil, but the one in which they are most productive, is a light fresh loam. In a strong rich soil, the plants are luxuriant, but afford fewer berries, and those of inferior flavour. They like an open situation.

TIME AND MODE OF SOWING.

They may be sown from the beginning of March to the middle of May; the earlier, however, the better; one sowing, and that a small one, is quite sufficient for a moderate sized family.

The seed may be inserted in a drill, two inches deep, along its bottom, in a single row, with a space of two or three inches between every two, or they may be dibbled in at a similar distance and depth. The minor is likewise often sown in patches. The major should be inserted beneath a vacant paling, wall, or hedge, to which its stems may be trained, or in an open compartment, with sticks inserted on each side. The runners at first require a little attention to enable them to climb, but they soon are capable of doing so unassisted. The minor either may trail along the ground, or be supported with short sticks. If water is not afforded during dry weather, they will not shoot so vigorously, or be so productive. They flower from June until the close of October. The berries for pickling must be gathered when of full size, and whilst green and fleshy, during August.

TO OBTAIN SEED.

For the production of seed, some plants should be left ungathered from, as the first produced are not only the finest in general, but are often the only ones that ripen. They should be gathered as they ripen, which they do from the close of August even to the beginning of October. They must on no account be stored until perfectly dry and hard. The finest and soundest seed of the previous year's production should alone be sown; if it is older the plants are seldom vigorous.

VALERIANA LOCUSTA.—CORN SALAD, OR LAMBS' LETTUCE.

It is cultivated for winter and spring salads, and for this purpose has been long known. The first

dish formerly brought to table, was a red herring set in a corn salad.

SOIL AND SITUATION.

It will flourish in any soil that is not particularly heavy; the best is a mouldy moderately fertile loam, in an open situation.

TIME AND MODE OF SOWING.

It is propagated by seed, which may be sown in February and the two following months, and once a month during the summer, if in request; but it is not so palatable during this season. Lastly, during August and early in September, the plants from which will be fit for use in early spring, or during the winter, if mild. Three sowings are in general quite sufficient for a family, viz. one at the end of February, a second early in August, and a third early in September.

The seed may sown in drills, six inches apart, or broadcast, and raked in. The only cultivation required is the keeping them free from weeds by frequent hoeings, they being previously thinned to four inches asunder. They should always be eaten quite young. In summer, the whole plant may be cut, as they soon advance to seed at this season; but in spring and winter the outer leaves only should be gathered, as directed for spinach.

TO OBTAIN SEED.

For the production of seed some of the spring-raised plants must be left ungathered from. They flower in June, and perfect their seed during the two following months.

VICIA.

Vicia is the Latin name for the tare or vetch; derived, according to Varro, a viciendo, *because its tendrils entwine or bind round other plants.*

VICIA FABA.—BEAN.

VARIETIES.

The varieties are:—

Early Mazagan.
Early Lisbon, or Portugal bean.
Common Sword, and other Long-pods.
Small Spanish.
Broad Spanish.
Toker.
White and Black blossomed.
Windsor.
Green Nonpareil.

Besides these, there are the Munford, Dwarf-cluster, or Fan, and the Red blossomed, varieties of little value. In some places the Fan is, however, much grown.

SOIL AND SITUATION.

The soil should vary with the season. For the winter-standing and early crops, a moderately rich and dry soil is best adapted to them, since, if too moist, the seed is apt to decay, &c., whilst a moist aluminous one is best for the spring and summer insertions. Although the bean will succeed in much lighter soils than is generally imagined, yet, if such are allotted to it when thus late inserted, the produce is much diminished. The situation cannot

be too unincumbered, but still a protection from violent winds is very beneficial, as no plant is more liable to suffer, if its leaves are much injured.

TIMES AND MODES OF SOWING.

It is propagated by seed. For the first production, in the following year, a small plantation may be made at the close of October or during November, and a rather larger one in December. These should be inserted on a south border, in a row, about a foot from the fence, or in cross rows. If intended for transplanting, the seed may be sown likewise during these months. Regular plantations may be continued to be made from the beginning of January to the end of June, once every three weeks. Early in July and August the two last crops must be inserted. The Windsor, which is the principal variety then planted, should have a south border allotted; it comes into production about Michaelmas.

The experiments of Bradley serve as a guide in some respects, whereby to apportion the extent of the plantations. He found that a rod of ground, containing fourteen rows, in pairs, at two feet distance, the plants in which are six inches apart, or thirty-four in number, will yield forty-seven quarts of broad beans. Smaller varieties only from one-half to one-third as many *.

SOWING FOR TRANSPLANTING.

If the plants are intended to be transplanted, which is only practised for the early crops, the seed must be sown thick, about an inch apart, in a bed of light earth, in a sheltered situation, and of such extent as can be covered with a frame. If frames and hand-glasses are deficient, matting or litter,

* General Treat. on Husband. and Garden., vol. iii. p. 16.

kept from pressing on and injuring the plants, by means of hooping, &c., are sometimes employed. These, however, afford such imperfect shelter, that is scarce any advantage superior to the mode of sowing at once where the plants are to remain, since the intention of this practice is to keep them in vigour, and to forward their growth, by securing them from ungenial weather. Care must be taken that they are not weakened from a deficiency of air or light; to guard against it, the lights should be taken entirely off every day that excessive wet or cold does not imperatively forbid their removal. The usual time for removing them into the open ground, in a south border, is February; if, however, the season is inclement, they may be kept under the frame until May; but then a week previous to their removal, Bradley informs us, they ought to be cut down within two inches of the ground*. When removed, as much earth as possible should be retained round the roots of the plants; and they must be set at similar distances as the main crops. No water is required, unless the season be very dry.

SOWING TO REMAIN.

When sown to remain, the seed may be inserted in rows, by a blunt dibble, or in drills, drawn by the hoe, from two and a half to three feet apart, from two to four inches apart in the row, and two deep, the earliest crops and shortest varieties being set at the smallest distances. The spaces may be considered as large by some gardeners; but the Beans, Miller, from experience, asserts, are more productive than if set twice as close. Previous to sowing, in summer, if dry weather, the seed should be soaked for two or three hours in water, or if sown in

* General Treat. on Husband. and Garden.

drills, these be well watered immediately before the insertion.

When advanced to a height of two inches, hoeing between, and drawing earth about the stems of the plants, may commence. This must be often repeated, and even sooner begun to the early and late crops, as it affords considerable protection from frost and wind. As soon as the various crops come into blossom, two or three inches length of each stem is broken off; this, by preventing its increase in height, causes more sap to be afforded to the blossom, consequently causing it to advance with more rapidity, and set more abundantly. Some gardeners recommend the tops to be taken off when the plants are young, not more than six inches high, declaring it makes them branch, and be more productive. This may be ultimately the effect, but it is certainly incorrect to state that it brings them into production sooner; the effect in this respect is much the contrary.

The winter-standing crops require, in the early stages of their growth, the shelter of dry litter, prevented touching the plants by small branches, &c. This is only requisite during very severe weather; it must be constantly removed in mild open days, otherwise the plants will be spindled and weakened.

TO OBTAIN SEED.

For the production of seed, plantations of the several varieties should be made about the end of February, in a soil lighter than that their produce is afterwards to be grown upon. No two varieties should be grown near each other; and in order to preserve the early ones as uncontaminated as possible, those plants only which blossom and produce their pods the first, should be preserved. Water ought to be given two or three times a week, from the time of their blos-

soming until their pods have done swelling. None of the pods ought to be gathered for the table from them; the after-production of seed is never so fine, and the plants raised from it are always deficient in vigour. They are fit for harvesting when the leaves have become blackish, which occurs at the end of August or early in September. They must be thoroughly dried, being reared against a hedge until they are so, before the seed is thrashed out and stored; and those only should be preserved that are fine and perfect. Some gardeners even recommend the pods from the lower part of the stem alone to be selected. Seed beans will sometimes vegetate after being kept for eight or ten years, but are seldom good for any thing when more than two. The plants arising from seed of this age are not so apt to be superluxuriant as from that produced in the preceding year.

HORTICULTURAL CALENDAR.

It is to be premised that, in the following Calendar of Work which requires the Gardener's attention in each month of the year, very few of the notices are to be considered as imperative directions. The variations of soil, season, climate, &c., render it impossible to more than intimate those operations which are *usually* required in each month in the midland districts of England; and many are often noticed in several successive months, merely to show that, if previously neglected, they may still be performed.

The following contractions are employed: *b*, for beginning of the month; *m*, for middle; *e*, for end.

January.

Artichokes, attend to, shelter, &c.
Asparagus, plant in hotbed.
——— attend to that in forcing.
Beans, plant, *b*.
——— earth up early ones.
——— plant in hotbed.
Beet (red), plant for seed.
Cabbages, plant, *e*.
——— sow, *e*.
——— plant for seed.
Cardoons, attend to, shelter, &c.
Carrots, sow small crop
——— plant for seed.
Cauliflowers, attend to those under frames, as also those pricked out.
——— sow, *e*.
Celery, earth up, shelter, &c.
Composts, prepare and turn over.
Cucumbers, sow.
——— prick out
Dung, prepare for hotbeds.
——— wheel on to vacant ground.
Earth, prepare for hotbeds.
Earth up plants disturbed by frost, &c.

Endive, blanch.
Frost, protect plants from that require it.
Ground (vacant), dig trenches, &c.
Hotbeds, make and attend to.
Horse Radish, plant, *e.*
Jerusalem Artichokes, plant, *e.*
Kidney Beans, sow in hotbeds, *e.*
Liquorice, plant, *e.*
——— dig up three year old plants.
Lettuces, in frames, attend to.
——— transplant to force.
——— sow, *e.*
Melons, sow.
Mint, force in hotbed.
Mushroom beds, make.
——— attend to those in production.
Mustard and Cress, sow in hotbed.
Onions (winter standing), clean from weeds.
——— examine those in store.
——— sow small crop, *e.*
——— plant for seed.
Parsley, sow, *e.*
Parsnips, plant for seed.
Peas, sow.
——— earth up advancing.
——— plant in hotbed.
——— prepare sticks for.
Potatoes, plant.
Radishes, sow in hotbed.
——— sow in border, *e.*
Rape (for salading), sow in hotbed.
——— (edible-rooted), sow.
Savoys, plant for seed.
Shelter tender plants from frost.
Small salading, sow.
Spinach, clean from weeds, advancing.
——— sow, *e.*
Tansy, plant in hotbed.
Tarragon, plant in hotbed.
Turnips, plant for seed.
Weeds, continually destroy, and do every thing that may be to lessen the work of the next month, which is generally more busy than this.

February.

Artichokes, defend in frosty weather.
Asparagus, sow, *e.*
——— plant, *e.*
——— plant in hotbed.
——— attend to that in forcing.
Balm, plant.
Beans, plant.
——— draw earth to advancing plants.
——— transplant those raised under frames.
Beets, sow, *e.*
——— plant for seed.
——— dig up, and store any left in the bed.
Borecole, sow, *m. e.*
Broccoli, sow, *m. e.*
Burnet, sow, *m. e.*
Cabbages, plant.
——— sow.
——— plant for seed.

Cauliflowers, attend to, in frames.
—— plant into border, *e.*
—— sow, *b. m.*
—— prick out.
Carrots, sow, *m. e.*
—— sow, to draw young, in a hotbed.
—— plant for seed.
Celery, dress and earth up winter-standing.
—— sow in a hotbed or warm border.
Chervil, sow.
Clary, sow, *m. e.*
Composts, prepare and turn over.
Coriander, sow.
Corn Salad, sow.
Cucumbers, sow in hotbeds.
—— prick and plant out.
—— attend to those in forcing.
Dill, sow, *m. e.*
Dung, prepare for hotbeds.
Earthing up, perform where necessary.
Endive, blanch.
—— transplant into frames.
Fennel, sow or plant.
Garlick, plant.
Horse Radish, plant.
Hotbeds are variously required.
Jerusalem Artichokes, plant.
Kidney Beans, sow in hotbed, &c.
Leeks, sow, *m. e.*
—— transplant for seed.
Lettuces, in frames, attend to, and transplant from, *e.*
—— sow in a warm border or hotbed, *b. m.*; and in any open situation, *e.*
Lettuces, prick out seedlings into a moderate hotbed.
Liquorice, plant.
—— dig up three-year-old roots.
Melons, attend to those in hotbeds
—— sow.
—— prick out.
Mint, force in a hotbed.
—— make plantations.
Mushroom beds, make.
—— attend to those in production.
Mustard and Cress, sow, *m. e.*
Onions, sow main crop, *m. e.*
—— clear of weeds, winter-standing.
—— (potatoe) plant.
Parsley, sow, *m. e.*
—— (Hamburgh) sow, *m. e.*
Parsnips, sow main crop, *m. e.*
—— dig up, and store winter-standing.
—— plant for seed.
Peas, sow.
—— hoe, advancing.
—— stick, when three inches high.
—— attend to those in hotbeds.
—— plant in hotbeds, *b. m.*
Pennyroyal, plant, *m. e.*
Potatoes (early), plant in hotbeds, *b. m.*; and in borders, *m. e.*
Radishes, sow in a hotbed, *b. m.*
—— attend to those in hotbeds.
—— sow in open ground.
Rape, sow for salading.
—— (edible-rooted), sow.
Rhubarb, sow.

Spinach, sow, *b. m.*
——— clear from weeds advancing crops.
Shalots, plant.
Scorzonera, sow, *m. e.*
Sorrels, sow and plant, *m. e.*
Skirrets, sow, *m. e.*
Salsafy, sow, *m. e.*
Savoys, sow, *m. e.*
Sage, plant, *e.*
Savory, plant, *e.*
Turnips, sow, *e.*
——— plant, for seed.
Tansy, plant, *e.*
Tarragon, plant, *e.*
Thyme, plant, *e.*
Vacant ground, dig, manure, &c.
Weeds, destroy, &c.

March.

Alexanders, sow,
——— earth up those sown in autumn.
Angelica, sow or plant.
Artichokes, spring-dress, *e.*
——— plant.
Asparagus, sow.
——— plant.
——— force in hotbed.
——— dress established beds.
Balm, plant.
Basil, sow.
Beans, plant.
——— earth up advancing.
Beet (red, white, and green), sow.
Borage, sow.
Borecole, sow, *e.*
Broccoli, sow, *e.*
——— of that now in production, mark some for seed.
Burnet, plant and sow.
Cabbages, plant.
——— earth up, &c. former plantations.
——— sow.
Carraway, sow.
Carrots, sow.
Cauliflowers, plant out from frames.
——— attend to those under glasses.
——— prick out spring-raised.
——— sow, *b.*
Capsicum, sow, *e.*
Cardoons, sow, *e.*
Celery, sow.
——— dress and earth up autumn planted.
Chamomile, plant.
Chives, plant.
Celeriac, sow.
Clary, sow.
Cress (American), sow.
Chervil, sow.
Composts prepare and turn over.
Coriander, sow, *e.*
Corn Salad, sow.
Cucumbers, sow,
——— prick out.
——— ridge out.
——— attend to the impregnation, &c., of those in forcing.
Dill, sow.
Dung, prepare for hotbeds.
Earthing up, attend to.

Fennel, sow or plant.
Garlick, plant.
Hotbeds, make, attend to linings, &c.
Hyssop, sow, *e.*
Horse Radish, plant.
Hoeing, attend to in dry weather.
Herbary, clean and dress in dry weather.
Jerusalem Artichokes, plant.
Kidney Beans, sow, *e.*
——— attend to, in hotbed.
Kale (Sea), plant or sow.
——— force.
Leeks, sow.
Lettuces, plant from frames, *e.*
——— sow.
——— prick out early sown.
Lavender, plant.
Liquorice, plant, *b.*
Marjorams, sow and plant.
Melons, sow.
——— prick out.
——— ridge out.
——— attend to those in forcing.
Mint, plant.
——— clean old beds.
Marigolds, sow.
Mushroom beds, make.
——— attend to those in production.
Mustard and cress, sow.
Nasturtium, sow.
Onions, sow main crop.
——— those raised in autumn transplant for bulbing.
——— plant for seed, *b.*
Onions (Potato), plant.
——— (Tree), plant.
Orach, sow.
Parsnips, sow.
Peas, sow.
——— earth up, and stick.
——— attend to those in hotbeds.
Pompions, sow, *e.*
Purslane, sow, *e.*
Parsley, sow.
——— (Hamburgh), sow.
Potatoes, plant.
——— attend to those in forcing, and on borders.
Pennyroyal, plant.
Radishes, sow.
——— thin, &c., those advancing.
Rochambole, plant.
Rosemary, plant.
Rue, plant.
Rampion, sow.
Rape, for salads, sow.
——— (edible-rooted), sow, *e.*
Rhubarb, sow, *b.*
Spinach, sow.
——— attend to advancing.
Shalots, plant.
Small Salading, sow.
Sage, plant.
Savoys.
——— lay in old stumps to produce sprouts.
Salsafy, sow.
Scorzonera, sow.
Skirrets, sow.
Sorrels, plant and sow.
Savory, plant and sow, *e.*
Succory, sow,
Tree Onion, plant.
Tetragonia, sow, *e.*
Tansey, plant.
Tarragon, plant.
Thyme, sow.

Tomatos, sow, *e*.
Turnips, sow, *b*. *e*.
Vacant ground, dig, manure.
Weeding, in general, attend.
Wormwoods, sow.

April.

Alexanders, sow.
Angelica, sow.
Artichokes, dress.
——— plant, *b*.
Asparagus, sow.
——— plant.
——— force in hotbed.
——— dress established beds.
Beans, plant.
——— hoe, and attend to advancing.
Beet (red, green, white), sow, *b*.
Borecole, sow.
——— prick out seedlings.
——— leave for seed.
Broccoli, sow.
——— prick out seedlings.
——— leave for seed.
Basil, sow.
Borage, sow.
Burnets, sow and plant.
Balm, plant.
Cabbages, plant.
——— prick out seedlings.
——— sow.
——— earth up, &c. advancing crops.
Carrots, sow.
Carrots, weed advancing crops.
Cardoons, sow.
Capsicum, sow.
Cauliflowers, plant out from glasses.
——— prick out seedlings.
——— sow, *b*.
Celery, sow.
——— earth up and dress old plantations.
——— leave for seed.
Colewort, plant.
Cucumbers, sow.
——— prick out seedlings.
——— ridge out.
——— attend to advancing and productive crops.
Chervil, sow.
——— leave for seed.
Clary, sow.
Coriander, sow.
Chamomile, plant.
Chives, plant.
Carraway, sow.
Cress (American), sow.
Dill, sow.
Dung, prepare for hotbeds.
Endive, sow, *e*.
——— leave for seed.
Earthing up, attend to.
Fennel, sow or plant.
Finochio, sow.
Garlick, plant, *b*.
Horse Radish, plant, *b*.
Hyssop, sow and plant.
Hotbeds, make and attend to.
Jerusalem Artichokes, plant, *b*.
Kale (Sea), sow and plant, *b*.
Kidney Beans (dwarfs), sow.
——— (runns.) sow, *e*.
Kidney Beans, attend to, in hotbeds.

Leeks, sow, *b. e.*
—— leave for seed.
Lettuces, sow.
—— plant out from frames.
—— prick out seedlings.
—— tie up, &c., those of advanced growth.
Lavender, plant.
Mint, plant.
Melons, sow.
—— prick out.
—— ridge out.
—— attend to advancing crops.
Mustard and cress, sow.
———— leave for seed.
Mushroom-beds, make.
———— attend to.
Marjorams, sow and plant.
Marigolds, sow.
Nasturtiums, sow.
Onions, sow, *b. e.*
—— leave for seed.
—— weed advancing crops.
—— (Potato), plant, *b.*
—— (Tree), plant.
Orach, sow.
Potatoes, plant, *b.*
—— attend to, in forcing.
Parsneps, sow, *b.*
——— hand-weed advancing crops.
Parsley, sow.
—— leave for seed.
—— (Hamburgh), sow.
Peas, sow.
—— hoe, stick, &c., advancing.
Pompions, sow, *b.*
Purslane, sow.
Pennyroyal, plant.
Rape, sow.
Radishes, sow.
——— thin, &c., advancing.
Rhubarb, plant.
Rochambole, plant, *b.*
Rue, plant.
Spinach, sow.
—— thin, &c., advancing.
—— leave some winter-standing for seed.
Savoys, sow, *b.*
—— prick out seedlings.
Shallots, plant, *b.*
Savory, sow.
Sorrels, sow and plant.
Sage, plant.
Small Salading, sow.
Salsafy, sow, *e.*
Scorzonera, sow, *e.*
Skirrets, sow, *e.*
Slugs, caterpillars, &c., search for amongst lettuces, &c.
Tomato, sow.
Thyme, sow and plant.
Tansy, plant.
Tarragon, plant.
Thin advancing crops, and weed generally.
Turnips, sow, *b. e.*
——— leave for seed.
Turnip Cabbage, sow.
Watering, attend to, in dry weather.
Wormwoods, sow.

MAY.

Angelica, sow.
Artichokes, plant, *b.*
———— clean beds of.

Asparagus-beds, weed; come now into production.
Beans, plant.
—— hoe, top, &c., those advancing.
Beet (Red), thin, &c., advancing crops.
—— (Green, White), sow.
Basil, plant out.
Borecole, plant out.
—— sow, *b.*
—— prick out.
—— attend to advancing crops, and leave some for seed.
Broccoli, plant.
—— sow, *b.*
—— plant.
—— prick out.
—— leave for seed.
Burnets, sow and plant.
Borage, sow.
Balm, plant.
Cabbages, sow.
——— plant.
——— earth-up, &c., advancing crops.
Cauliflowers, attend to such as are protected, and take off glasses, &c.
———— sow, *e.*
Carrots, thin, &c., advancing.
—— sow.
Capsicum, plant out.
Celery, plant.
—— prick out.
—— (old), leave for seed.
—— sow, *b.*
Crops failed, replace without delay.
Cucumbers, sow.
Cucumbers, prick out.
———— plant.
———— attend to those in production.
Coriander, sow.
———— leave for seed.
Chervil, sow.
—— leave for seed.
Chamomile, plant.
Chives, plant.
Cress, (American) sow.
—— (Water), plant.
Dung, for hot-beds, prepare.
Dill, sow and plant.
Endive, sow.
—— leave for seed.
Earthing-up, attend to, where necessary.
Fennel, sow and plant.
Finochio, sow.
——— clean, &c., advancing crops.
Hot-beds, attend to, coatings, &c.
Hyssop, sow, and plant.
Kidney Beans (dwarfs), sow, *b.*
———— (runners), sow.
———— transplant from hot-beds.
Kale (Sea), attend to blanching, forcing, &c.
Lettuces, plant out.
—— sow.
—— tie up, &c., those of full growth.
Leeks, thin, &c., advancing crops.
—— sow, *b.*
—— leave for seed.
Lavender, plant.
Melons, sow, *b.*

Melons, prick out.
—— ridge out.
—— attend to those advancing.
Mint, plant.
Marjorams, sow and plant.
Marigolds, sow.
Mushroom-beds, make, *b.*
——— attend to those in production.
Mustard and Cress, sow, and leave for seed.
Nasturtiums, sow, *b.*
Onions, weed, &c.
—— (Welsh), leave for seed.
—— sow for planting again in the spring.
Potatoes, plant, *b.*
Pompions, ridge out, *b.*
——— sow, *b.*
Parsley, sow.
—— leave for seed.
—— (Hamburgh), thin.
Parsneps, thin, &c.
Purslane, sow.
——— leave for seed.
Pennyroyal, plant.
Radishes, sow.
——— leave for seed.
Rosemary, plant.
Rape (edible-rooted), sow, *e.*
—— for salading, sow.
Rue, plant.
Salsafy, thin, &c.
Scorzonera, thin, &c.
Spinach, sow.
—— thin advancing.
—— leave some for seed.
Sage, plant.
Savoys, plant.
—— sow, *b.*
Savoys, prick out.
Small Salading, sow
Savory, sow and plant.
Sorrels, sow and plant.
Tomatos, plant out.
Tarragon, plant.
Turnips, sow.
—— thin, &c., advancing.
—— leave for seed.
Turnip Cabbage, sow.
Thyme, sow and plant.
Tansy, plant.
Thinning, attend to.
Watering, attend to, in dry weather.
Weeds, destroy continually.

JUNE.

Alexanders, earth-up.
Artichokes, weed, &c.
Asparagus-beds, clean, &c.
Beans, plant.
—— hoe, &c., advancing crops.
Beets, thin, &c.
Borecole, plant.
—— sow, *b.*
—— prick out.
Broccoli, sow, *b.*
—— prick out.
—— plant.
Basil, plant, *b.*
Cabbages, sow.
—— prick out.
—— plant.
—— earth-up, &c.
Capsicum, plant, *b.*
Carrots, thin, &c.

Cauliflowers, prick out seedlings.
—— earth-up, &c.
—— leave for seed.
Celery, sow, *b*.
—— plant.
—— earth-up, advancing.
Celeriac, plant.
Coleworts, sow for.
—— plant.
Cucumbers, sow, *b*.
—— plant, *b*.
—— in forcing, attend to.
Cardoons, thin and plant out.
Coriander, sow.
Cress (American), sow.
—— (Water), plant.
Earthing-up, attend to.
Endive, sow, *b*.
—— plant.
Fennel, plant.
Finochio, sow.
—— earth-up advancing crops.
Garlic is fit for present use.
Herbs for drying and distilling, gather.
Jerusalem Artichokes, hoe, &c.
Kidney Beans (dwarfs), sow.
—— (runners), attend to.
Leeks, thin, &c.
—— transplant, *e*.
Lettuce, sow.
—— plant, &c.
—— leave for seed.
Melons, plant out.
Mint, plant.
Onions, thin, &c.
—— transplant into deficiencies.
Parsley, sow.
Parsley (Hamburgh), thin.
Parsneps, thin.
Peas, sow.
—— attend to advancing crops.
Potatoes, hoe, &c.
Pompions, plant, *b*.
Radishes, sow.
Rampion, thin.
Sage, plant.
Salsafy, thin.
Savoys, plant.
—— prick out.
Scorzonera, thin.
Scurvy Grass, sow.
Seeds, attend to and gather.
Small Salading, sow.
Spinach, sow.
—— thin advancing.
Stir ground between crops, in rows, &c.
Succory, sow.
Tarragon, plant.
Thinning, attend to.
Tomatos, plant out, *b*.
Turnips, sow.
—— thin advancing.
Turnip Cabbage, sow.
—— plant.
Watering } attend to.
Weeding }
Wormwood, plant.

July.

Alexanders, earth-up.
Artichokes, attend to.
Asparagus-beds, clean.
—— leave off cutting from.
Beans, plant, *b*.

Beans, leave some in production for seed.
Beet (red), thin, *b*.
—— (green, white), sow, *b*.
Borage, sow, *e*.
Borecole, plant.
—— prick out.
Broccoli, prick out.
—— plant.
Cauliflowers, plant, *e*.
Cabbages, plant.
—— prick out seedlings.
—— sow.
—— earth-up advancing.
Carrots, thin, *b*.
—— sow, *b*.
Celery, prick out.
—— plant.
—— earth-up.
Celeriac, plant.
Chamomile Flowers, gather.
Coleworts, plant.
Coriander, sow.
Chervil, sow, *e*.
Cucumbers, attend to.
Cress (American), sow.
Earth-up where necessary.
Endive, plant.
—— sow.
Finochio, earth-up.
Garlic, take up as wanted.
Horse Radish, attend to.
Hoeing, particularly attend to.
Kidney Beans (dwarfs), sow.
———— (runners), sow, *b*.
———— attend to advancing crops.
Lavender, gather.
Leeks, weed, &c.
Leeks, plant, *b*.
Lettuces, plant.
—— sow.
—— leave for seed.
Marigold Flowers, gather.
Marjoram, gather for drying.
Melons, attend to.
Mint, plant, *b*.
Mushroom-beds, attend to.
—— make, *e*.
—— Spawn, collect.
Onions, weed, &c.
—— press down leaves.
—— sow, *b*.
Parsley, sow.
—— (Hamburgh), thin, &c.
Parsneps, weed, &c.
Peas, sow.
—— hoe advancing.
—— leave for seed.
Peppermint, gather.
Pompions are fit for pickling.
——— attend to.
Pot-herbs are fit in general for drying and distilling.
Radishes, sow.
Rampion is fit for use, *e*.
Rape (edible-rooted), sow.
Salsafy, thin, &c.
Savoys, plant.
Scorzonera, thin, &c.
Scurvy Grass, sow.
Seeds, gather as they ripen.
Small Salading, sow.
Spinach, sow.
—— hoe and thin.
Stir ground between plants.
Succory, sow.
Turnips, sow, *b*.

Turnips, hoe advancing crops.
Turnip Cabbage, prick out.
Vacant ground dig, free from weeds, &c.
Water, where necessary.
Wormwood, plant.

AUGUST.

Alexanders, sow.
Angelica, sow.
Aromatic herbs may still be planted.
——— gather for drying and distilling.
Artichokes, break down, &c.
Asparagus-beds, weed.
Balm, plant.
—— gather for drying.
Beans, plant, *b.*
Borage, sow.
Borecole, plant.
Broccoli, plant, *b.*
Cabbages, plant out.
—— sow, *b.*
Celery, prick out.
—— plant.
Chervil, sow.
Corn Salad, sow.
Cauliflowers, plant.
—— sow, *e.*
Coleworts, sow for, *b.*
—— plant.
Celeriac, earth-up.
Cardoons, earth-up.
Carrots, sow, *b.*
Cress (American), sow.
Cucumbers, plant or sow, *b.*
Cucumbers, attend to advancing.
Dill is fit for gathering.
Earthing-up, attend to.
Endive, plant.
—— sow, *b.*
—— blanch, &c., advancing crops.
Fennel, sow and plant.
Finochio, earth-up.
Garlic, take up.
Hoeing, attend to.
Kidney Beans, sow, *b.*
Leeks, plant, *b.*
Lettuces, sow.
—— plant out.
Melons, attend to.
Mint, gather for drying.
Mushroom-beds, make.
——— attend to.
Nasturtium Berries, gather.
Onions, sow, *b.* and *e.*
Parsley, sow, *b.*
Peas, sow, *b.*
Radishes, sow.
—— (Pods), gather for pickling.
Rape (edible-rooted), sow.
Rochambole, take up.
Shallots, take up.
Savoys, plant, *b.*
Seeds, gather as ripe.
Small Salading, sow.
Spinach, sow.
Stir between plants in rows, &c.
Turnips, sow, *b.*
—— thin, &c.
Turnip Cabbage, plant.
Weeding and Watering, attend to.
Wormwood, plant, *b.*

SEPTEMBER.

Angelica, sow.
Aromatic and pot-herbs, finish gathering.
Artichokes, break down.
Asparagus, plant for forcing.
——— Beds, weed, &c.
Balm, plant.
Beans, earth-up, &c., *e*.
Beet (red), may be taken up as wanted, *e*.
Borage, sow.
—— thin advancing crops.
Borecole, plant, *b*.
Broccoli, plant, *b*.
Burnet, plant.
Cabbages, sow, *b*.
—— plant.
—— earth-up advancing.
—— (red), are ready for pickling.
Cardoons, earth-up.
Carrots, advancing, thin.
Cauliflowers, prick out.
—— draw earth to advancing.
Celery, earth-up.
—— plant.
Chervil, sow.
Coriander, sow.
Corn Salad, sow.
Coleworts, plant out.
Cucumbers, attend to.
—— sow, *b*.
—— ridge out, *b*.
Cress (American), sow, *b*.
—— (Water), plant.
Dill, sow.
Earthing-up, attend to.
Endive, plant.
Endive, attend to, blanch, &c.
Fennel, plant.
Finochio, earth-up.
Herbary, requires dressing, *b*.
Hoeing, attend to.
Hyssop, plant.
Jerusalem Artichokes, take up as wanted, *e*.
Kidney Beans, earth-up advancing, *b*.
Lettuces, plant out, *b*.
—— sow.
Leeks, plant, *b*.
—— attend to advancing.
Melons, attend to.
Mint, plant.
Mushroom-beds, make.
—— (Spawn), collect.
Nasturtium Berries, gather as they become fit.
Onions, sow, *b*. for transplanting in spring.
——— attend to those advancing.
——— gather for storing.
——— (Potato), take up for storing.
Orach, sow.
Pennyroyal, plant.
Pot Marjoram, plant.
Peas, hoe, &c.
Parsley, cut down.
Radishes, sow, *b*.
Rhubarb, sow.
Sage, plant.
Savory, plant.
Savoys, plant.
Seeds, gather as they ripen.
Small Salading, sow.
Sorrel, plant.

Spinach, sow, *b*.
Thyme, plant.
Tansy, plant.
Tarragon, plant.
Turnips, sow, *b*.
—— hoe advancing.
Turnip Cabbage, plant, *b*.

October.

Angelica, sow.
Asparagus-beds, dress, *e*.
——— for forcing, plant.
Beans, plant, *e*.
Beet (red), take up for storing, *e*.
—— leave or plant out for seed.
Borecole, plant, *b*.
—— earth-up, &c.
Broccoli, plant, *b*.
—— earth-up, &c.
Balm, plant.
Burnet, plant.
Cabbages, prick out, &c.
—— plant for seed.
Cardoons, earth-up.
Carrots, take up, to store, *e*.
—— leave or plant out for seed.
—— thin young crops.
Celery, plant.
—— earth-up.
Coleworts, plant.
Cauliflowers, prick out in borders, to stand the winter, and by way of precaution, in frames, &c.
———— plant, *e*.
Cucumbers, plant, *b*.
Chives, plant.
Cress (Water), plant.
Dill, sow.
Dung, prepare for hot-beds.
Endive, attend to, blanch, &c.
Earthing-up, attend to.
Fennel, plant.
Garlick, plant, *e*.
Herbary, dress.
Horse Radish, plant.
Hyssop, plant.
Jerusalem Artichokes, store, *e*.
Leeks, plant, *b*.
—— hoe, &c., advancing crops.
Lettuces, plant, *b*.
—— prick out, *e*.
Leaves, fallen, remove continually.
Mint, plant.
Mushroom-beds, make.
——— attend to those in production.
Nasturtium Berries, gather as they ripen.
Onions, attend to those in store.
—— thin.
—— plant for seed.
—— (Potato), plant.
Parsley, cut down, *b*.
—— (Hamburgh), is fit for use.
Peas, sow, *e*.
Parsneps, take up for storing, *e*.
——— leave or plant out for seed.
Pennyroyal, plant.
Potatoes, dig up, *e*.
Rosemary, plant.
Rue, plant.
Radishes, sow, *b*.
Rhubarb, sow.
Shallots, plant, *e*.

Small Salading, sow.
Sage, plant.
Sorrel, plant.
Savory, plant.
Savoys, plant for seed.
Salsafy is in perfection.
——— take up for storing.
Scorzonera is in perfection
——— take up for storing.
Spinach, thin, &c.
Seeds, gather as they ripen.
Stir between rows of plants.
Tansy, plant.
Tarragon, plant.
Tomatos, gather.
Thyme, plant.
Thinning, attend to.
Turnips, plant for seed.
——— hoe young crops.
Vacant ground, trench, drain, &c.

November.

Artichokes, winter, dress.
Asparagus-beds, dress.
——— plant to force.
——— attend to that in forcing.
Beans, plant, *e.*
Beet (red), dig up for storing.
——— leave or plant out for seed.
Cabbages, plant.
——— plant out for seed.
Cardoons, earth-up, *b.*
Carrots, dig up and store, *b.*
——— leave or plant out for seed.
Cauliflowers, prick out, *b.*
——— attend to, under glasses, &c.
Celery, earth-up.
——— plant.
Coleworts, plant.
Cucumbers, attend to, in forcing.
Composts, prepare.
Dung, prepare, for hot-beds.
Drain vacant ground.
Earthing-up, attend to.
Endive, blanch, &c.
Garlic, plant, *b.*
Herbary, clean, &c.
Horse Radish, dig up and store.
Hot-beds, make salading, &c.
Jerusalem Artichokes, dig up and store.
Lettuces, plant in frames.
——— attend to those advancing.
Leaves, &c., continually clear away.
Mint, plant.
——— force in hot-bed.
Mushroom-beds, make.
——— attend those in production.
Onions in store, look over.
——— (winter-standing), thin.
——— plant for seed, *b.*
——— (Potato), plant.
Parsley, cut down, *b.*
Parsneps, dig up and store, *b.*
——— leave or plant out for seed.
Peas, sow, *b.*
Potatoes, dig up, *b.*
Radishes, sow, *e.*
——— sow, in hot-bed.

Shallots, plant, *b.*
Salsafy, dig up and store.
Scorzonera, dig up and store.
Savoys, plant for seed, *b.*
Small Salading, sow.
——— sow in hot-bed.
Spinach, thin, &c.
Seeds, dress and store.
Trench, ridge, &c., vacant ground.
Thinning, attend to.
Weeds, destroy continually.

DECEMBER.

Artichokes, dress.
Asparagus Beds, dress, *b.*
——— plant to force.
——— attend that in forcing.
Beans, plant.
Beets (red), dig up and store, *b.*
Borecole, earth-up.
Broccoli, earth-up.
Cabbages, plant.
—— earth up.
Cauliflowers in frames, &c., attend to.
Carrots, dig up and store, *b.*
Celery, plant.
—— earth-up.
Coleworts, plant.
Cucumbers, sow, *e.*
—— attend to those advancing.
Composts, prepare and turn over.
Dung, prepare for hot-beds.
Earthing up, attend to.
Endive, blanch.
Hot-beds, attend to.
Kidney Beans, force, *e.*
Leaves, fallen, remove.
Lettuces, plant in hot-beds.
—— attend those advancing.
Liquorice, dig up.
Mint, force.
Mushroom-beds, make.
——— attend those in production.
Parsneps, dig up and store, *b.*
Peas, sow, both in the open ground and in hot-beds.
—— attend to those advancing.
Plants to produce seed, attend to, *b.*
Radishes, sow, *b.*
Small Salading, sow in frames, &c.
Spinach, clear of weeds.
Tansy, force.
Tarragon, force.
Trench, drain, &c., vacant ground.
Weeding, attend to.

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